

MOTIVE POWER AND DISTRIBUTION
CHARGES OF A PACKING PLANT

BY

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ARMOUR INSTITUTE OF TECHNOLOGY

1918

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MOTIVE POWER AND DISTRIBUTION CHARGES OF A PACKING PLANT

A THESIS

PRESENTED BY

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TO THE

PRESIDENT AND FACULTY

OF

ARMOUR INSTITUTE OF TECHNOLOGY

FOR THE DEGREE OF

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Distribution of Steam Charges
 Distribution of Refrigeration Charges
 Distribution of Light & Power Charges
 Distribution of Water Charges
 Distribution of Air Charges

Curve Sheets:

Cu.Ft.Am.To Be Compressed To Produce One Ton Refrigeration.	
Suction Gas Saturated & Dry.....	1
Cu.Ft.Am. to be Compressed To Produce One Ton of Refrigeration	
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FOREWORD

A Packing Plant consists of various departments for the killing of live stock and the manufacture of by-products. Each department must work on an economical basis for the production of their goods. A certain definite time must be set for the compiling of this data - therefore a fiscal year.

The fiscal year is divided into periods, say six; the first period of ten weeks, the next four of eight weeks and the last, ten weeks. In order to manufacture there must be motive power, i.e. steam, refrigeration, power and light and compressed air, which must be taken into consideration in the final charges of the product. To do this there must be a system whereby these charges can be obtained and distributed.

The total amount of steam, refrigeration, electric energy and compressed air are determined in the power house where the different units are that generate this energy. A log is kept each day called the Power House Daily Record, where the data relative to these units are recorded. The Construction Department tabulates all the repairs and supplies of the engine room and the various departments of the plant.

The time-keepers keep a record of the number of men and salaries paid. The Master Mechanic's Office takes care of all other charges, such as fuel, lubricants, ammonia, brine, etc.

At the end of each period a summation of all this data is collected by the Master Mechanic's office and compiled, to be used in making a Motive Power Report. This re-

port shows just how much steam, refrigeration, electric energy, compressed air and water is generated and used and the total cost to produce the same. This report is a basis for the distribution of motive power charges. The last sheet shows a summary of energy and cost used by the Motive Power Department and subtracted from the total generated, gives the balance to the plant.

In order to distribute this balance to the plant, a series of tests must be made on the different departments to determine how much of this energy is used per ton of product. These rates form a basis for calculating the amount of energy used by the departments. Each department furnishes the Accounting Department with the tonage of product it has produced or handled, which in turn is used by the Master Mechanic's Office to compile another report called the Distribution of Motive Power Charges.

This report is divided into the different motive power headings such as Steam, Refrigeration, Power and Light, Air and Water. Each sheet has a list of the departments which use motive power. On these sheets the number of units are the tons of product. The rate per unit is the amount per ton of product and multiplied by the units gives the first extension figure. On the steam sheets the square feet of heating surface in each department is listed. This steam for heating added to the first extension gives the calculated figure. The balance to the plant figured from the Motive Power Report is the total corrected figure. This divided by the total calculated gives the correction factor which multiplied by the calculated figures gives the corrected figure.

On the Refrigeration sheets the equivalent Cu. Ft. under Refrigeration is the amount of space used by each department for refrigerating purposes. The Cu. Ft. per Ton is arrived at by means of excess outside temperature above temperature at which the rooms are held. The calculated tons for holding is determined by dividing the equivalent Cu. Ft. by the Cu. Ft. per Ton. The total tons for departments is taken from the Motive Power Report. The total first extension tons is subtracted from the total tons which is the total for the corrected tons. This divided by the calculated tons is the factor of correction and multiplied by the calculated tons gives the corrected tons. The First Extension tons plus the corrected tons gives the total tons used by departments.

For the Light and Power sheet the same method applies. Most departments are metered. In some cases one meter supplies several departments and a percentage is made according to the tonnage and the meter reading split accordingly. For light the K.W.H. Con. Load in lights is determined by the amount of lights in each department and multiplied by a rate of K.W.H. per week (determined by tests for this period).

On the Water sheets the number of employees in each department are taken into consideration. Four hundred gallons per week for each employee is estimated as a fair average. This is added to the First Extension to give the calculated figure.

A percentage basis is used on the Air sheets where no rates have been made. The tonnages are multiplied by the rates and the total figure subtracted from the total air. The result is multiplied by the percentages

and both extended to the total column. This concludes the report as far as the Master Mechanic's Office is concerned.

The total cost of Steam, Refrigeration, Power and Light, Air and Water, taken from the summary sheet-balance to the plant- is formed into a percentage. The report is sent to the Accounting Department which applies this percentage to the correct cost which this department has.

The figure for Steam is placed on the Steam sheet total under the column "Distribution"; the same for Refrigeration, etc. This cost divided by the total energy used is the cost per unit of energy and multiplied by the energy used by each department is the cost to each department for Motive Power.

Conclusion.

These reports compared with previous reports places each department under surveillance as to its economic use of mechanical energy. It also forms a comparison with reports of other plants under the same company for like products.

GENERATION AND TRANSMISSION OF STEAM

1. Plant Capacity

(a) No. Boilers in Plant	40
(b) Total Rated H.P.	16800
(c) Avg. Rated H.P. in Operation ..	14700
(d) Total Rated H.P. Hours	19576800
(e) Total B.H.P.H. Produced (8a) .	26900000
(f) Avg. PerCent Rating Developed.	137

2. Tons Coal Burned, Kind Coal and Cost

(a)	Tons	at		
(b) 14262	"	MineRun	" \$3.60	\$ 51343.20
(c) 7131	"	Lump	"	25671.60
(d) 14262	"	Scgs.	" 3.40	48490.80
(e) 12540	"	MineRun	" 3.60	45144.00
(f) 48195	Total Tons	-Total Cost	\$	170649.60

3. Fuel Oil Burned

(a) Total No. Bbls.	15230
(b) Avg. Degs. Beaume	30
(c) Avg. Weight per Bbl.	303
(d) No. Tons Oil Burned	2307
(e) Avg. Cost per Bbl.	\$ 2.94
(f) Total Cost Oil for Fuel	\$ 44776.20

4.

(a) Avg. Temp. Water to Boilers ...	192
(b) " " Supply to Heater ...	34

5. Avg. Evap. F. & A. 212° shown by Boiler Tests

(a) Kind Coal	Evap.	
(b) " " Harrisburg	" 6.50	
(c) " " "		
(d) " " Ill. Scgs.	" 7.96	
(e) " " Scgs.	" 7.50	
(f) Avg. in prop. to Dif. Coals Burned	7.32	
(g) " Evap. F. & A. 212° from Tests with Oil		

6.

(a) Avg. Factor Evap. from Tests ..	1.053
(b) " " " Based on Temp. to Heater	1.213

7. Data from Feed Water Meters

(a) Total actual Lbs. Evap.	766705600
(b) " Lbs. Evap. F. & A. 212°	807500000
(c) Lbs. Evap. F. & A. 212° per Lb. Coal .	8.38
(d) Ratio Item (7c) to (5f or g) ..	

8.

(a) Total B.H.P.H. Prod. in Boilers .	269000000
(b) " " " by Heater ..	3495000
(c) " " Produced	30395000

9. B.H.P.H. used in Boiler Room (Take 1/3 Total Calculated if exhaust goes to Heater)

(a) Filter Pumps	
(b) Heater	
(c) Boiler Feed Pumps	286917
(d) Stoker Engines	46000
(e) Steam Jets	
(f) Atomizing Oil	120500
(g) Boiler Wash Pump	4120
(h) Oil Pumps	
(i) Heating Feed Water	2330000
(j) Heating Fuel Oil	
(k)	

(l)	
(m) Total for Boiler Room	2787557

10. Total net B.H.P.H. Produced..... 27607463

11.

(a) Total No. Gal. Feed Water Boilers	110500000
(b) Est. Gal. Trap Disch. Ret'd Heater	3040
(c) Gal. Condensate-Ex. Steam to "	14700
(d) Total Gal. from Feed Water Supply	92760
(e) Cost Feed Water per M Gallons	\$.0625
(f) Total Cost Feed Water	\$ 5798.60

12. Electric Energy Consumed in Boiler Room

(a) Coal Conveyors	
18469 K.W.H. at \$.01520 K.W.H.	\$ 280.00
(b) Ash Conveyors	
18222 K.W.H. at " " " "	277.00

(c)Boiler R.Lgts.		
16800 K.W.H.at \$.01520 K.W.H.	\$	255.00
(d)Stokers		
(e)B.H.No.2 Lgts.		
7390 K.W.H.at " " "		112.10
(f)		
(g)Total Cost	\$	924.10
13.		
(a)Estimated M Cu.Ft.Free Air for Boiler Cleaning		1886
(b)Total Cost Compressed Air for Boiler Room	\$	59.40
14.Water for Boiler Cleaning		
(a)Source.....	City	
(b)Discharged to	Sewer	
(c)Total M Gallons Used	2500	
(d)Charge per M Gallons	\$.0625	
(e)Total Charge	\$	156.35
15.Cost of Labor for Operation		
(a)Boiler R.Portion Eng.Wages 3% ..	\$	109.08
(b)Unloading Fuel Cars(48195x.07)		3373.65
(c)Handling to Firing Fl.		428.00
(d)Firemen & Water Tenders.....		7543.32
(e)Handling Ashes		2737.30
(f)Boring Boilers		503.00
(g)Clng.Furnaces,Tubes & Breeching		755.00
(h)Feed Water Treating		
(i)Janitor Service		122.00
(j)Testing)		
(k)Reports) 15%		133.80
(l)		
(m)		
(n)Total Cost Labor for Operation..	\$	15705.15
16.Supplies		
(a)Lubricants		
1 Gals. 600 W. at \$.55 Gal..	\$	.55
73 " At.Red " .16 $\frac{1}{2}$ "		12.03
286 " L.P.Cyl. " .25 "		71.30

(b)Waste and Misc.Supplies	\$	114.97
(c)Packing		
(d)Gauge Glasses		
(e)Boiler Compound		
(f)		
(g)		
(h)Total Cost Supplies	\$	208.85
17.Repairs		
(a)Replacing Tubes in Boilers ...	\$	538.00
(b)Shells,WaterColumns,Gauges,etc		
(c)Boiler Room Piping		860.00
(d)Feed Pumps.....		
(e)Other Boiler Room Pumps		
(f)Furnace Brickwork & Supports .		2907.76
(g)Stoking Apparatus & Grates ...		1037.42
(h)Fuel Handling Machinery		166.99
(i)Ash " "		644.79
(j)Misc.		406.86
(k)Setting		
(l)Main Lines Outside Boiler Room		
(m)Bunkers		
(n)Feed Water Heaters		62.95
(o)Feed Water Treating Plant		
(p)Oil Burners		403.02
(q)Blow-off Headers to Hot Well .		500.29
(r)Total Cost Repairs	\$	7528.08
18.		
(a)Total Cost Boiler R. Complete.	\$	540409.00
(b)Annual Rental Charge, 6%		32424.54
(c)Annual Depreciation Chg., 5% .		27020.45
(d)Rental Charge for Period		4863.68
(e)Depreciation Chg.for " 5% .		4053.07
(f)Boiler Insurance		
(g)Pump Proration		555.39
19.Credit for Cinders Sold		
20.		
21.		
22.		

23. Total Net Cost Fuel, Water, Electric Power, Compressed Air, Labor, Supplies, Repairs, Rent, Depreciation, Insurance, Taxes.....\$255278.47
24. Total Cost per Net B.H.P.H.
Produced\$.00925

REFRIGERATION

1. Data on Oper. of Compressors

(a) Number of Machine	1	2
(b) Rated Tons Refrigeration..	400	400
(c) " H.P. of Engine	603	608
(d) Type of Engine	Corliss	
(e) Avg. Absolute Suction Pres..	28.4	28.4
(f) " " Condenser "	166.4	166.4
(g) " Suction Temp.	-1	-1
(h) " Discharge "	169	103
(i) "Quality" of Suction Gas ..		
(j) Avg. Inches Vacuum	19.3	19.3
(k) Total No. Revolutions Made.	2366280	3600000
(l) " " Hours Run	939	1265
(m) Avg. Speed, R.P.M.		
(n) Total Rated H.P.H.	565000	770000

2. Calculation of Refrigeration
Produced & Power Required

(a) Volumetric Efficiency	80.0	81.3
(b) Cu. Ft. Displaced per Rev. .	37.59	37.59
(c) " " Compressed " " ..	30	30.5
(d) Total Cu. Ft. Gas Comp. M	70988	109600
(e) Cu. Ft. ton Refrigeration ..	5900	5900
(f) Tons Refrigeration Prod'd.	12000	18550
(g) Ammonia H.P. per ton Refg..	1.04	1.04
(h) Fac. Obt. Actual Steam H.P..	1.53	1.54
(i) Steam I.H.P. per ton Refg..	1.592	1.605
(j) Basis B.H.P. per I.H.P. ...	.41	.41
(k) Factor to Correct Avg. Load	1.08	1.02
(l) " " " " Vacuum	1.25	1.25
(m) Corrected B.H.P. per I.H.P.	.554	.523
(n) B.H.P.H. per ton Refg.	21.10	20.10
(o) Total B.H.P.H.	253000	373000
(p) Exhaust Steam to	Condenser	
(q) B.H.P.H. Consumed (1/3 total if exhaust is used)	253000	373000
(r) K.W.H. per ton Refg.		
(s) Total K.W.H.		
(t) Avg. percent load on engine	81.0	93.0

1.						Booster
(a)	3	4	5	6	1	2
(b)	600	600	600	600	75	75
(c)	837	865	935	800	223	223
(d)	-----Corliss-----					
(e)	28.4	28.4	28.4	28.4	17.4	17.4
(f)	166.4	166.4	166.4	166.4	28.4	28.4
(g)	-1	-1	-1	-1	-26	-26
(h)	138	107	111	102	-1	-1
(i)						
(j)	19.3	19.3	19.3	19.3		
(k)	905236	634740	2750400	2100560		
(l)	374	328	1146	796	753	120
(m)						
(n)	313000	283000	1070000	636800	167500	26800
2.						
(a)	70.0	76.9	75.7	95.6	74.5	74.5
(b)	57.35	57.35	57.35	25.45		
(c)	40	44	43.4	24.34		
(d)	36200	27850	119200	51250		
(e)	5900	5900	5900	5900		
(f)	6130	4725	20250	8700		
(g)	1.04	1.04	1.04	1.04		
(h)	1.54	1.56	1.45	1.52		
(i)	1.605	1.625	1.510	1.581		
(j)	.41	.41	.41	.41	.8	.8
(k)	1.10	1.20	1.16	1.36		
(l)	1.25	1.25	1.25	1.25		
(m)	.564	.615	.594	.696		
(n)	21.70	23.95	21.50	21.40		
(o)	131800	113000	436000	229000	180500	214000
(p)	-----Condenser-----				-----Heater-----	
(q)	131800	113000			60167	7134
(r)						
(s)						
(t)	75.4	65.2	68.4	52.0		

COST OF PRODUCTION OF REFRIGERATION

3. Cost Steam to Drive Compressors	\$	15213.15
4. Air to Blow Oil 5660 at .015		84.90
5. Cost Labor to Oper. Compr. & Cond.:		
(a) Portion Engineers' Wages <u>40%</u>		1454.36
(b) Oilers.....		1680.00
(c) Janitor Service <u>30%</u>		78.00
(d) Cleaning Ammonia Condensers....		
(e) Operating " "		
(f) Test 25%.....		223.00
(g) Total Labor.....		3435.36
6. Cost of Supplies:		
(a) Lubricants,		
345 Gals. 600 W. at \$.55 Gal.	\$	191.95
657 Gals. At. Red " .165 "		108.41
282 " L.P. Cyl. " .25 "		70.50
366 " Polar Ice " .21 "		76.86
(b) Waste).....)		
(c) Steam Packing.....)		134.10
(d) Ammonia Packing.....)		
(e).....Total	\$	581.82
7. Cost of Repairs:		
(a) Gen. Overhauling of Compressors.	\$	
(b) Minor Repairs to Compressors...		300.09
(c) Oiling System.....		
(d) Exhaust Line to Exhaust Header.		
(e) Steam Lines to Header.....		
(f) Ammonia Discharge Lines in Eng. Rm		
(g) " Suction " " " "		
(h) Liquid Ammonia Pump.....		
(i) Engine Room Tools.....		
(j) Ammonia Condensers.....		
(k) Liquid Receivers.....		
(l)		
(m) Misc.....		609.00
(n) Total Cost Repairs.....	\$	909.09
8. Refg. Portion of Eng. Rm. Lighting:		
(a) No. K.W.H.....		6525
(b) Charge.....	\$	114.06

9.
 (a) Ammonia Put into System
 8204 Lbs. at \$.213 lb....\$ 1740.06
 (b) Ammonia "Expense"
 70355 Tons Refg. at \$.07 ton...\$ 4924.85
 10. Cost of Water and Pumping for
 Ammonia Condensing.....\$ 683.50
 11. Ice Machine Portion of total
 Steam Condensing Cost\$ 2472.74
 12.
 (a) Total Value Compr., Con. & Cond. \$273674.59
 (b) Annual Rental Charge.....6% 16420.44
 (c) " Depreciation Chg. 5% 13683.73
 (d) Rental Charge for Period 2522.00
 (e) Depreciation Chg. for Period, 5% 2100.00
 (f) Insurance
 (g) Taxes
 13.
 (a) Total Cost Production of Refg..\$ 29856.68
 (b) Cost Production of Refg. per ton

DISTRIBUTION OF REFRIGERATION

14. Cost of Labor
 (a) Portion of Engineers' Wages ___%\$
 (b) Temperature Men 2965.00
 (c) Expansion Men
 (d) Knocking Ice off Suction Lines. 1449.65
 (e) Pickle Tenders
 (f) Removing Ice from & Cleaning
 out Expansion Piping
 (g) Cleaning out Spray Nozzles.....
 (h) Testing
 (i) Reports
 (j)
 (k)
 (l) Total Cost Labor\$ 4414.65
 15. Cost of Supplies
 (a)
 (b)

16. Cost of Repairs		
(a) Circulation Fans.....	\$	
(b) Brine Tanks.....	\$	620.47
(c) Piping in Brine Tanks.....		
(d) Main Suction & Liquid Lines....		866.46
(e) Suction Accumulators.....		
(f)		
(g)		
(h)		
(i) Total Cost Repairs.....	\$	1486.93
17. Brine Pumping		
(a) Total M Gallons pumped.....		
(b) " Cost Steam for Pumping 23038		213.10
(c) " " Elec. Power for " 15942		278.67
(d) " " Labor, Supplies, Repairs		194.22
(e) Rent & Depreciation Charge		
(f)		
(g) Total Cost Brine Pumping	\$	685.99
18. Other Pumps used in Distr. Refg..		
(a) No. Pump		
(b) Pump Used for		
(c) M Gallons Pumped		
(d) Total Cost Steam.....18526		171.36
(e) " " Elec. Power 255		4.46
(f) " Cost Labor, Supplies, Repairs		274.86
(g) Rent & Depreciation Charge		
(h)		
(i)		
(j) Total Cost	\$	450.68
19. Power to Drive Circulation Fans		
13031 K.W.H. at \$.01748 K.W.H. \$		227.78
20. Salt for Strengthening Brine		
73.5 tons at \$ 3.25 ton ...	\$	238.38
27.5 " " 14.00 " ...		385.00
21.		
(a) Total Cost Equip. for Distrib. \$		400000
(b) Annual Rental Charge, 6%		24000
(c) " Depreciation Charge, 5%		20000
(d) Rental Charge for Period		3600

(e) Depreciation Chge for Period 5%\$	3000
(f) Insurance.....	
(g) Taxes.....	
22.	
23.	
24.	
(a) Total of Charges against Distribution of Refgn.....	14489.41
(b) Total of Charges for Production and Distribution	44346.09
25. Total Cost Per Ton Refrigeration Produced	.6303

ELECTRIC POWER & LIGHT

1. Data on Operation of Power and Light Units
 - (a) Number of Machine
 - (b) Power or Light Unit
 - (c) Total No. Hours Run
 - (d) Speed, R.P.M.
 - (e) Rated K.W. of Generator
 - (f) " H.P. " Engine
 - (g) Total Rated K.W. Hours
 - (h) " " Engine H.P. Hours
 - (i) Type of Engine
 - (j) Avg. Inches Vacuum
2. Electric Output and Steam Consumption
 - (a) Total K.W.H. Produced-Power
 - (b) " " " -Light
 - (c) " " " -Total
 - (d) Avg. Per Cent Load on Generator
 - (e) Per Cent Mech. & Elec. Efficiency
 - (f) I.H.P. per K.W.
 - (g) Total I.H.P.H.
 - (h) Avg. Per Cent Load on Engine
 - (i) Basis B.H.P. per I.H.P.
 - (j) Factor to Correct for Avg. Load
 - (k) " " " " " Vacuum
 - (l) Actual B.H.P. per I.H.P.
 - (m) B.H.P. per K.W.
 - (n) Total B.H.P.H.
 - (o) Exhaust Steam to
 - (p) B.H.P.H. Consumed (1/3 total if Exhaust is used)

1.

(a)	1	2	3	1	2	3
(b)	-----Light-----			-----Power-----		
(c)	284	597	617	696	958	657
(d)	200	145	145	85	82	82
(e)	250	500	500	1500	800	800
(f)	514	842	842	1657	936	790
(g)	71000	298500	308500	1042000	861400	525600

(h)	145800	502500	520000	1152000	806000	518500
(i)	-----Corliss-----			-----Corliss-----		
(j)	19.3	19.3	19.3	19.3	19.3	19.3
2.						
(a)				510300	440300	371800
(b)	54200	258800	278150			
(c)			591100			1322400
(d)	76.4	86.7	90.3	48.8	51.1	70.7
(e)	79.5	81.5	82.5	68.5	70.0	78.0
(f)	1.685	1.642	1.625	1.955	1.915	1.716
(g)	91400	425000	452500	99750	843000	635000
(h)	62.7	84.7	87.1	86.5	104.2	122.5
(i)	.55	.55	.55	.41	.41	.41
(j)	1.20	1.06	1.04	1.04	1.01	1.04
(k)	1.25	1.25	1.25	1.25	1.25	1.25
(l)	.825	.730	.715	.533	.516	.533
(m)	1.39	1.20	1.16	1.04	.988	.914
(n)	75500	310500	324000	531000	436000	340000
(o)	-----Condenser-----			-----Condenser-----		
(p)			710000			1307000

Cost of Generating Electric Energy

3. Total Cost Stm. to Drive Gen. Units \$ 18657.25

" Cost Air to Blow Oil,

5670 M at .015 \$ 85.05

4. Cost Labor to Operate Gen. Units

(a) Portion of Engineers' Wages 30% \$ 1090.77

(b) Oilers 1697.50

(c) Switchboard Men 833.00

(d) Janitor Service 40% 104.00

(e) Testing & Indicating)

(f) Reports 15% 133.80

(g)

(h)

(i)

(j) Total Cost Labor \$ 3859.07

5. Cost of Supplies

(a) Lubricants

312 Gals. 600 W. at \$.55 Gal.. \$ 171.60

546 Gals. At.Red	at \$.165 Gal.	\$	90.09
282 " L.P.Cyl. "	.25 "		70.50
(b)Waste)			
(c)Packing)			61.02
(d)			
(e)			
(f)			
(g)Total Cost Supplies	\$		363.21
6. Cost of Repairs			
(a)General Overhauling of Engines	\$		
(b)Minor Repairs to Engines			79.03
(c)Repairs to Generators			
(d)Oiling System			
(e)Exhaust Line to Exhaust Header.			
(f)Steam Lines to Header			
(g)Repairs to Switchboard			
(h)			
(i)Misc.			699.00
(j)			
(k)Total Cost Repairs	\$		778.03
7.Pr.& Lgt.Portion Eng.R.Lighting			
8680 K.W.H. at \$.01520 K.W.H. ...	\$		131.94
8.Power & Light Portion of Total			
Steam Condensing Cost	\$		3245.07
9.Total Cost of Generating Units,			
Switchboard & Connections	\$	175365.00	
(b)Annual Rental Charge, 6%		10521.90	
(c) " Depreciation Charge, 5%		8868.25	
(d)Rental Charge for Period		1618.25	
(e)Depreciation Chg.for Period, 5%	\$	1364.34	
10.			
11.			
12.			
(a)Total Cost Gen.Elec.Pr. & Light	\$	30102.72	
(b) " " Generation per K.W.H.			

Cost of Power and Light Distribution

13. Cost of Repairs

(a)Distributing Lines	\$	78.67
-----------------------------	----	-------

1	...
2	...
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100	...

(b)		
(c)		
(d)		
(e) Total Cost of Repairs	\$	78.67
14. Cost of Labor		
(a) Motor Tenders	\$	814.69
(b) Lamp Trimmers		
(c)		
(d)		
(e) Total Cost Labor	\$	814.69
15. Cost of Supplies		
(a) Brushes, Sandpaper, Lubricants, etc		
(b)		
(c)		
(d) Total Cost Supplies		
16. Total Cost Distribution Equip.	\$	145000.00
(b) Annual Rental Charge, 6%		8700.00
(c) " Depreciation Charge, 5%		7250.00
(d) Rental Charge for Period		1338.46
(e) Depreciation Chg. for Period 5%	\$	1115.40
17.		
18.		
19.		
(a) Total Cost Distr. Elec. Energy	\$	3347.22
(b) Cost Distributing per K.W.H.		
20.		
(a) Total Cost Generation & Distribution	\$	33449.94
(b) Total Cost per K.W.H.	\$	.01748

COMPRESSED AIR

Wells & House Line

1. Data Operation of Compressors		
(a) Number of Machine	2	4
(b) Rated Cu.Ft. per Minute	4000	4000
(c) Avg. Final Air Pressure	150	150
(d) Total No. Revolutions Made ..	4633990	3819100
(e) " " Hours Run	1069	798
(f) Avg. Speed, R.P.M.		
(g) Rated H.P. of Engine	573	775
(h) Total Rated Engine H.P.Hrs. ..	613000	617500
(i) Type of Engine	---Corliss---	
(j) Single or Two Stage Compr. ..	2	2
(k) Avg. Inches Vacuum		
2. Calculation of Air Compressed and Power Required		
(a) Volumetric Efficiency	90	90
(b) Cu.Ft. Displaced per Rev. ..	51.4	51.3
(c) " " Compressed " " ..	46.26	46.17
(d) Total Cu.Ft. Air Compr. M ..	213850	176000
(e) Cu.Ft. Free Air Compressed per I.H.P.H.	257	257
(f) Total I.H.P.H.	831000	686000
(g) Avg. PerCent Load on Engine ..	141.5	111.0
(h) Basis B.H.P. per I.H.P.	.67	.67
(i) Factor to Correct Avg. Load ..	1.16	1.00
(j) " " " " Vacuum ..		
(k) Corrected B.H.P. per I.H.P. ..	.776	.67
(l) Total B.H.P.H.	645000	460000
(m) Exhaust Steam to	---Heater---	
(n) B.H.P.H. Consumed (1/3 total if Exhaust is used)	215000	153334
(o) K.W. per I.H.P.		
(p) Total K.W.H. to Drive Compr. ..		
3. Cost Steam to Drive Compressors \$		3407.09
4. " Elec. Power to " " ..		
" Air to Blow Oil 2830 at .01343 \$		38.10
5. Cost Labor to Operate Compressors		
(a) Portion of Engineers' Wages 5% \$		181.79

(b) Oilers	\$	281.00
(c) Janitor Service	13%	33.80
(d) Testing and Indicating)		
(e) Reports	10%	89.20
(f)		
(g)		
(h)		
(i) Total Cost Labor	\$	585.79
6. Cost of Supplies		
(a) Lubricants		
136 Gals. 600 W. at	\$.55 Gal.	\$ 74.80
242 " At. Red "	.16 $\frac{1}{2}$ "	40.13
126 " L.P. Cyl. "	.25 "	31.50
134 " Polar Ice "	.21 "	28.14
(b) Waste)		
(c) Air Packing)		
(d) Steam Packing) Misc.	\$	74.00
(e)		
(f)		
(g)		
(h) Total Cost Supplies	\$	248.57
7. Cost of Repairs		
(a) General Overhauling of Compr. .	\$	
(b) Minor Repairs to Compressors ..		
(c) Oiling System		
(d) Exhaust Lines to Exhaust Header		
(e) Steam Lines to Header		
(f) Main Air Lines		
(g) Receivers		
(h) Engine Room Tools		
(i)		
(j) Misc.		310.67
(k)		
(l) Total Cost Repairs	\$	310.67
8. Air Compressor Portion of Engine Room Lighting		
(a) No. K.W.H.		2160
(b) Charge	\$	34.40
9. Air Compressor Portion of Total		

Steam Condensing Cost	\$	
10. Water for Intercoolers and Com-		
pressor Jackets		3500
(a) Total M Gallons Used		
(b) Charge per M Gallons	\$	.035
(c) Total Charge	\$	122.50
11.		
(a) Total Cost Air Compressors Com-		
plete with Receivers & Connections	\$	63020.00
(b) Annual Rental Charge, 6%		3781.20
(c) " Depreciation Charge, 5%		3151.00
(d) Rental Charge for Period		581.70
(e) Depreciation Chg. for Period 5%		484.78
(f) Insurance		
(g) Taxes		
12.		
13.		
14.		
15.		
(a) Total Cost Compressed Air	\$	5813.60
(b) " " per M Cu.Ft. Free Air		
Compressed	\$	.015

COMPRESSED AIR, cont'd

House Line

1. Data on Operation of Compressors

(a) Number of Machine	3
(b) Rated Cu.Ft. per Minute	4000
(c) Avg. Final Air Pressure	80
(d) Total No. Revolutions Made	2325000
(e) Total No. Hours Run	765
(f) Avg. Speed, R.P.M.	
(g) Rated H.P. of Engine	415
(h) Total Rated Engine H.P. Hrs.	317000
(i) Type of Engine	Corliss
(j) Single or Two Stage Compressor ..	2
(k) Avg. Inches Vacuum	19.3

2. Calculation of Air Compressed and Power Required

(a) Volumetric Efficiency	90
(b) Cu.Ft. Displaced per Rev.	56.0
(c) " " Compressed " "	50.4
(d) Total Cu.Ft. Air Compressed M ...	117200
(e) Cu.Ft. Free Air Comp'd per I.H.P.H	350
(f) Total I.H.P.H.	335000
(g) Avg. PerCent Load on Engine	105.8
(h) Basis B.H.P. per I.H.P.	.67
(i) Factor to Correct for Avg. Load .	1.00
(j) " " " " " Vacuum	1.25
(k) Corrected B.H.P. per I.H.P.	.836
(l) Total B.H.P.H.	315500
(m) Exhaust Steam to	Cond.
(n) B.H.P.H. Consumed (1/3 total if Exhaust is used)	
(o) K.W. per I.H.P.	
(p) Total K.W.H. to Drive Compressors	

3. Cost Steam to Drive Compressors \$ 2921.38

4. " Elec. Power to " "

" Air to Blow Oil 1415 at .01345 ¢ 19.00

5. Cost Labor to Operate Compressors

(a) Portion of Engineers' Wages, 5% ¢	181.79
(b) Oilers	140.00

(c) Janitor Service	13% \$	33.80
(d) Testing and Indicating)		
(e) Reports	5%	44.61
(f)		
(g)		
(h)		
(i) Total Cost Labor	\$	400.19
6. Cost of Supplies		
(a) Lubricants		
68 Gals. 600 W.	at \$.55 Gal.	\$ 37.40
121 " At.Red	" .165 "	20.07
63 " L.P.Cyl.	" .25 "	15.75
67 " Polar Ice	" .21 "	14.07
(b) Waste)		
(c) Air Packing)		
(d) Steam Packing).....		
(e)		
(f) Misc.	\$	38.84
(g)		
(h) Total Cost Supplies	\$	126.13
7. Cost of Repairs		
(a) Gen. Overhauling of Compressors		
(b) Minor Repairs to "		
(c) Oiling System		
(d) Exhaust Lines to Exhaust Header		
(e) Steam Lines to Header		
(f) Main Air Lines		
(g) Receivers		
(h) Engine Room Tools		
(i)		
(j) Misc.	\$	155.33
(k)		
(l) Total Cost Repairs	\$	155.33
8. Air Compressor Portion of Engine Room Lighting		
(a) No. K.W.H.		1080
(b) Charge	\$	17.20
9. Air Compressor Portion of Total Steam Condensing Cost		
	\$	510.74

10. Water for Intercoolers and Compressor Jackets

(a) Total M Gallons Used	1750
(b) Charge per M Gallons	.035
(c) Total Charge	\$ 61.25

11.

(a) Total Cost Air Compressors Complete with Receivers and Connections

.....	\$ 27920.00
(b) Annual Rental Charge, 6%	1645.20
(c) " Depreciation Charge, 5%	1396.00
(d) Rental Charge for period	253.10
(e) Depreciation Chg. for Period 5%	214.77
(f) Insurance	
(g) Taxes	

12.

13.

14.

15.

(a) Total Cost Compressed Air	\$ 4679.09
(b) " " per M Cu. Ft. Free Air	
Compressed	.04

PUMP REPORT

1. Data on Operation of Pumps

- (a) Pump No.
- (b) Type of Pump
- (c) " " Drive
- (d) Suction Taken from
- (e) Discharge to
- (f) Operation Chargeable to
- (g) Total Hours Run
- (h) Avg. Speed, R.P.M.
- (i) Total Revolutions Made
- (j) Avg. Head in Lbs.

2. Calculation of Delivery and Power Required

- (a) Assumed Per Cent Slip
- (b) Gals. per Rev. Total Disp.
- (c) " " " Less Slip
- (d) Total M Gals. Delivered
- (e) " H.H.P.H.
- (f) B.H.P. per H.H.P.
- (g) Total B.H.P.H. to Pump
- (h) Exhaust Steam to
- (i) B.H.P.H. Consumed ($1/3$ Total if Exhaust is Used)
- (j) Total Cost Steam
- (k) K.W.H. per H.H.P.
- (l) Total K.W.H. Consumed
- (m) Total Cost Electric Power

3. Cost of Labor for Operation of

Pumps

- (a) Portion of Engineers' Wages ...
- (b) Pump Tenders
- (c) Janitor Service
- (d) Testing
- (e) Reports
- (f)
- (g) Total Cost Labor

4. Cost of Supplies

- (a) Lubricants

5 Gals. 600 W.	at \$.55 Gal.	\$ 2.55
45 " At.Red	" .165 "	7.42
60 " L.P.Cyl.	" .25 "	15.00
(b)Waste	\$	.30
(c)Packing		
(d)Soda Ash		.20
(e)		
(f)Total Cost Supplies	\$	25.57
5. Cost of Repairs		
(a)Pumps	\$	2943.53
(b)Motor Driving Pumps		
(c)Turbines " "		
(d)Piping		
(e)		
(f)		
(g)Total Cost Repairs		
6. Portion of Total Steam Condensing Cost		
7. Electric Lighting for Pumps		
3700 K.W.H.	\$	58.90
8. Total Cost Pumping Equipment and Connections	\$	50878.00
9.		
(a)Annual Rental Charge, 6%	\$	3052.70
(b) " Depreciation Charge, 5%		2043.90
(c)Rental Charge for Period		469.60
(d)Depreciation Chg. for Period ..	\$	393.00
10.		
(a)Total Cost of Pumping		
(b)Pumping Cost per M Gals.		

PUMP REPORT, cont'd

1	(a)	1	2	4	5	6
	(b)	Cent.	Cent.	Dup.	Turb.	Simp.
	(c)	Turbine	Turb.	Steam	Cent.	Steam
	(d)	No.1	No.2	H.Water	No.1	St.Cond.
	(e)	H.L.	Tower	H.L.2	Heater	At.
	(f)	Water	W.	W.	Boiler	St.Cond.
	(g)	1344	1344	593		1120
	(h)		1375	12	2240	30
	(i)					
	(j)	45	45	45	43	11
2.	(a)	20	20			15
	(b)	1200	1400		1000	14.65
	(c)	G.P.M.	G.P.M.			12.45
	(d)	96750	113700	13200		4070
	(e)	42300	44000	3390		266
	(f)	2	2	4	2	3.5
	(g)	84600	88000	13560		931
	(h)	Heater	H.	H.	H.	H.
	(i)	28200	29333	4520		310
	(j)					
	(k)					
	(l)					
	(m)					
5.	(a)		16.49	7.56	159.53	20.67

1	(a)	7	8	9	10	12
	(b)	Simp.	Corliss	Dup.	C.Dup.	Cent.
	(c)	Steam	Steam	Steam	Steam	Turb.
	(d)	St.Cond.	St.Cond.	No.2	No.2	Heater
	(e)	At.	At.	H.L.	H.L.	Boiler
	(f)	St.Cond.	St.Cond.	W.	W.	"
	(g)	1028	1287	1329	1339	168
	(h)	30	30	12	22	2100
	(i)					

(j)	11	11	45	45	160
2.					
(a)	15	15	15	15	
(b)	14.65	34.9	20.7	46.8	
(c)	12.45	29.6	26.1	39.8	1200
(d)	2305	6875	23450	67400	12100
(e)	246	736	10250	29850	18800
(f)	3.5	3.5	4	2.5	2
(g)	861	2576	41000	73625	37600
(h)	Heater	H.	H.	H.	H.
(i)	287	859	13666	24542	12533
(j)					
(k)					
(l)					
(m)					
5.					
(a)	107.32	17.50	254.31	348.70	

1.					
(a)	14	15	16	18	19
(b)	Dup.	Dup.	Turb.	Dup.	Dup.
(c)	Steam	Steam	Cent.	Steam	Steam
(d)	Heater	Heater	No.1	No.1	No.3
(e)	Boiler	Boiler	Boiler	HeaterCool	Tow
(f)	"	"	"	BoilerSt.	Cond.
(g)	272	322	1294	1344	1384
(h)	12	12	2100	30	22
(i)					
(j)	160	160	160	160	50
2.					
(a)	25	25		15	15
(b)		19.8	1200	17.8	20.92
(c)	14.8	14.86		15.12	17.78
(d)	2580	3400	93000	36600	32450
(e)	3610	5250	144500	56800	15730
(f)	4	4	2	4	4
(g)	14440	21000	289000	227200	62920
(h)	H.	H.	H.	H.	H.
(i)	4813	7000	76333	75733	20970

(j)				
(k)				
(l)				
(m)				
5.				
(a)	18.38	51.58	210.90	518.13

1.					
(a)	20	21	24	25	26
(b)	Dup.	Dup.	C.Dup.	Dup.	Cent.
(c)	Steam	Steam	Steam	Steam	Turb.
(d)	No.3	No.3	No.1 & 2	No.3	No.1
(e)	Cool Tow	Cool Tow	H.L.	Cool Tow	H.L.
(f)	St.Cond.	St.Cond.	W.	St.Cond.	W.
(g)	1344	1344	1344	306	1334
(h)	22	22	27	25	1475
(i)					
(j)	50	50	43	50	40
2.					
(a)	15	15	15	15	
(b)	21.4	21.4	34.5	34.5	1400
(c)	18.2	18.2	29.3	29.3	G.P.M.
(d)	32000	31800	63300	142000	112100
(e)	15700	15450	32200	6530	43500
(f)	4	4	2.5	2.5	2
(g)	62800	61800	80500	16325	87000
(h)	H.	H.	H.	H.	H.
(i)	20930	20600	26833	5442	29000
(j)					
(k)					
(l)					
(m)					
5.					
(a)	68.09	44.54	21.09	61.98	46.48

1.					
(a)	27	31	35	39	40
(b)	Dup.	Dup.	Dup.	Dup.	Dup.
(c)	Steam	Steam	Steam	Steam	Steam

(d)	Brine	No.1	No.1	Brine	Trap
(e)	Refg.	H.L.	H.L.	Refg.	H.L.
(f)	"	W.	W.	"	Boiler
(g)	1334		714	731	
(h)	18	18	18	19	12
(i)					
(j)	20	40	40	43	20
2.					
(a)	15	15	15	15	15
(b)	17.8	17.72	23.3	17.8	4.71
(c)	15.12	15.05	19.8	15.1	4.00
(d)	21800		16180	12500	
(e)	4250		6275	5240	
(f)	4	4	4	4	4
(g)	17000		25100	20960	
(h)	H.	H.	H.	H.	H.
(i)	5666		8366	6786	
(j)					
(k)					
(l)					
(m)					
5.					
(a)			1.65		

1.					
(a)	42	44	45	46	47
(b)	Dup.	Dup.	-----Triplex Motor-----		
(c)	Steam	Steam	-----Motor-----		
(d)	1 & 2	1 & 2	-----No.1-----		
(e)	H.L.	H.L.	-----H.L.-----		
(f)	W.	W.	-----W.-----		
(g)		1338	873	876	867
(h)	30	5	33	46	46
(i)					
(j)	42	40	40	40	40
2.					
(a)	15	15	15	15	15
(b)	23.3	17.7	17.7	7.83	5.22
(c)	19.8	15.1	15.1	6.67	4.42

(d)		6050	11500	10750	10200
(e)		2340	4460	4175	4100
(f)	4	4			
(g)		9360			
(h)	H.	H.			
(i)		3120			
(j)					
(k)			1.25	1.25	1.25
(l)			5575	5594	51.25
(m)					
5.					
(a)	7.87				

1.					
(a)	48	49	51	56	58
(b)	Cent.	Dup.	Dup.	Dup.	Dup.
(c)	Turb.	Steam	Steam	Steam	Steam
(d)	No2	No2	2	1	
(e)	H.L.	H.L.	H.L.	H.L.	H.L.
(f)	W.	W.	W.	W.	W.
(g)	437	1000	1344		
(h)		22	22	20	36
(i)					
(j)	42	42	43	40	40
2.					
(a)			15	15	15
(b)	1200	5.24	12.05	16.08	14
(c)			10.25	13.68	11.9
(d)	31400	6950	18150		
(e)	12800	2810	7600		
(f)	2	4	4	4	4
(g)	25600	11240	30400		
(h)	H.	H.	H.	H.	H.
(i)	8533	3746	10133		
(j)					
(k)					
(l)					
(m)					

5.				
(a)	2.73	19.04		12.08

1.					
(a)	60	62	63	64	103
(b)	Dup.	-----Triplex-----			Cent
(c)	Steam	-----Motor-----			Turb.
(d)	1	-----Calcium-----			3
(e)	Boiler	-----Refg.-----			Tower
(f)	"	-----"			St. Cond.
(g)	424	460	460	222	1321
(h)	12	25	25	25	
(i)					
(j)	80	60	10	10	43
2.					
(a)	25				
(b)	17.43				
(c)	13.06	1.18	6.5	6.5	4000
(d)	3980	812	4480	2165	238000
(e)	3090	476	436	210	98400
(f)	4				2
(g)	12360				196800
(h)	H.				H.
(i)	4120				65600
(j)					
(k)		1.25	1.25	1.25	
(l)		595	545	262	
(m)					
5.					
(a)		22.16	18.43	1.26	

1.					
(a)	66	80	81	82	83
(b)	Cent.	-----Cent.-----			
(c)	Turb.	-----Motor-----			
(d)	2	-----Brine-----			
(e)	Am. Cond.				
(f)	Refg.	-----Refg.-----			
(g)	1286	320	30	260	320

(h)					
(i)					
(j)	43	20	20	20	20
2.					
(a)					
(b)		900	950	950	950
(c)	1400				
(d)	107850	17250	975	15010	18200
(e)	45000	3440	386	2980	3520
(f)	2				
(g)	90000				
(h)	H.				
(i)	30000				
(j)					
(k)		1.35	1.35	1.35	1.35
(l)		4644	521	4023	5352
(m)					
5.					
(a)			3.29		30.17

1.					
(a)	84	85	86	87	88
(b)	---Cent.-----		Cent.	Cent.	Dup.
(c)	---Motor-----		Turb.	Turb.	Steam
(d)	---Brine-----		Heater	Heater	Heater
(e)			Boiler	Boiler	Boiler
(f)	---Refg.-----		"	"	"
(g)			46	1322	28
(h)					
(i)					
(j)	20	20	150	150	150
2.					
(a)					
(b)	950	950	600		
(c)				2.89	
(d)			1662	47800	141
(e)			2420	70000	220
(f)			2	3.5	4
(g)			4840	245000	880

(h)			H.	H.	H.
(i)			1613	81666	293
(j)					
(k)	1.35	1.35			
(l)					
(m)					
5.					
(a)		41.51			

1.					
(a)	89	94	95	96	53
(b)	Cent.	Simp.	Simp.	Cent.	Dup.
(c)	Turb.	Steam	Steam	Turb.	Steam
(d)	1	W.H.3	W.H.3	St.Cond.	1 & 2
(e)	Heater	Am.Rec.	Rec.	Tower	H.L.
(f)	Boiler	Refg.	Refg.	Refg.	W.
(g)	1373	1080	1104	557	1300
(h)					8
(i)					
(j)	45	180	180	40	40
2.					
(a)					15
(b)					23.3
(c)		2.89	7.48	4000	19.8
(d)	92500	3800	7400	133200	12400
(e)	40400	4370	11510	55500	4820
(f)	2	3.5	3.5	2	4
(g)	80800	15295	40205	111000	19280
(h)	H.	H.	H.	H.	H.
(i)	26933	5098	13428	37000	6426
(j)					
(k)					
(l)					
(m)					
5.					
(a)		141.92	132.94	209.51	6.87

1.					
(a)	29	38	90	93	100
(b)	C.Dup.	Dup.			Turb.
(c)	Steam	Steam		Motor	Steam
(d)	1 & 2	Brine		Liquid	No.3
(e)	H.L.	Refr.		Rec.	Tower
(f)	W.			"	St.Cond.
(g)		334	1344	554	787
(h)	22	19			2200
(i)					
(j)	40	43		160	190
2.					
(a)	15				
(b)	34.8				
(c)	29.6	6.36			4000
(d)					
(e)		18920		1340	188880
(f)		7940		204	347000
(g)		4			2
(h)	H.	31760			694000
(i)		10586			231333
(j)					
(k)				1.25	
(l)				255	
(m)					
5.					
(a)		77.40			

WATER REPORT
Purchased Water

1.Total M Gallons Purchased	78%	410181
2.Cost per M Gallons	\$	.0625
3.Total Purchase Cost Water.....	\$	25636.31
4.B.H.P.H.Consumed in Pumping		153207
5.K. W. H. " " "		12710
6.Total Cost Steam for Pumping	\$	1417.16
7. " " Electric Power for Pumping		222.17
8.Total Cost Labor,Supplies,Repairs, Rent,etc. for Pumping		1097.61
9.Total Cost for Pumping		2736.94
10. " " Water and Pumping		28373.25
11. " " per M Gals.	\$	.0692

Local Water

12.Total M Gals. from Wells	22%	115953
13.M Cu.Ft.Free Air for Pumping ...		178662
14.B.H.P.H. Consumed in Pumping ...		43211
15.K.W.H. Consumed in Pumping		3584
16.Total Cost Compressed Air for Pumping	\$	2679.93
17.Total Cost Steam for Pumping ...		399.70
18. " " Electric Power for Pumping		62.65
19.Total Cost Labor,Supplies,Repairs,Rent,etc. for Wells		1187.74
20.Total Cost Water from Wells		4330.02
21. " " per M Gallons	\$	.0373

THE
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VOLUME 18
PART 1
1888
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1888

OPERATION OF WELLS			
1. Well Number	Wool	Power	Packers
2. Method of Pumping ..	-----	-----	-----
3. Depth of Well, Feet	1575	1581	1600
4. Dia. at Bottom-Inches	12	15	13
5. " " Top "	25	17	25
6. Water Level, Well Down, ... Feet	217	213	216
7. Water Level, Well in Operation Feet	230	360	230
8. Water Delivered to	---Ammonia Condenser---		
9. Total Hrs. in Service	449	25	947
10. Avg. Gals. per Minute	1360	1360	1360
11. Total M Gals. Del'd.	36638400	2040000	77275000
Air Lifts			
12. % Submergence, Well Down			
13. % Sub. Well in Oper			
14. Air Pres. to Blow off	167	210	163
15. " " " Operate.	160	153	160
16. Cu. Ft. Free Air, Gal.	1.656		
17. Total M Cu. Ft. Free Air Used	12962	12962	12962
18. Cost per M Cu. Ft. Free Air			
19. Total Cost Comp. Air	\$3185.46	-----	-----
All Wells			
20.			
(a) Total Value of Well Comp. with means for Pumping	\$ 18271.	14079.	16179.
(b) Ann. Rental Chg. 6%	1096.26	844.70	970.70
(c) " Depre. " 5%	913.55	703.95	808.95
(d) Rental Chg for Per.	168.68	129.96	149.34
(e) Depreciation Chg. for Period	\$ 140.54	108.30	124.44
(f) Insurance			
(g) Taxes			

STEAM AND AMMONIA CONDENSING

1. Cooling Tower		
(a) Water Taken From.....	Hot Well	
(b) " Discharged to	Reservoir	
2. Ammonia Condensers		
(a) Water Taken From	Wells & H.L.	
(b) " Discharged to	Reservoir	
3. Steam Condensers		
(a) Water Taken From.....	Cool Tower	
(b) " Discharged to	Hot Well	
4. Average Temperature Water		
(a) On Cooling Tower		98
(b) Off " "		59
(c) Difference		39
(d) On Ammonia Condensers		45
(e) Off " "		53
(f) Difference		8
(g) On Steam Condensers		58
(h) Off " "		103
(i) Difference		45
5. Height Above Pumps		
(a) Inlet to Cooling Tower		96'00"
(b) " " Ammonia Condensers .		70'00"
(c) " " Steam "		77'00"
6. Steam Condensed--B.H.P.H. % of		
	Cond.	Total
(a) Refrigeration	1535800	39.7
(b) Elec. Pr. & Lgt	2017000	52.1
(c) Compr'd Air	315500	8.2
(d) Pumping		
(e)		
(f)		
(g) Total	3868300	100.0
7. Total M Lbs. Steam Condensed ...		133400
8. Gals. Condensing Water per Lb.		
Condensed		2.6
9. Total M Gallons Water to Steam		
Condenser		346500

Water Going Over Cooling Tower, Ammonia
Condensers & Steam Condensers

10.

(a) Avg. Head in Lbs. at Pump

(b) Total M Gallons

11. Charge per M Gallons for Water

12. Total Charge for Water

13. Hydraulic H.P.H.

14.

(a) Boiler H.P.H. for Pumping

(b) Exhaust Steam Discharged to

(c) B.H.P.H. Consumed

15. K.W.H. for Pumping

16. Total Cost Steam for Pumping

17. " " Elec. Power for Pumping

18. " " Labor, Supplies, Repairs,

Rent & Depreciation for Pumping

19. Total of Costs for Water & Pumping

20. Ammonia Condensers

21. Steam "

Water Over Ammonia & Steam Condensers
Separately.

22.

(a) Avg. Head in Lbs. at Pump ..

(b) Total M Gals. Water to Cond

23. Charge per M Gallons

24. Total Chg. for Water

25. Hydraulic H.P.H.

26. Boiler H.P.H. for Pumping .. 30000 401875

27. K.W.H. for Pumping

28. Total Cost Steam for Pump .. \$277.50 3717.34

29. " " Elec. Pr. " "

30. " " Labor, Supplies, Repairs, Rent, & Depre. for Pump. \$406.00 1738.25

31. Total of Costs for Water and Pumping \$683.50 5455.59

Water Loss By Evaporation

32. Percent Loss Over Cooling Tower

33. Total M Gals. Lost Over Cool. "

34.	Value per M Gallons	
35.	Total Value Water Lost	
36.	Percent Chargeable to Amm.Cond'g	
37.	" " " Stm. "	
38.	Chg. to Ammonia Condensing	
39.	" " Steam "	
40.	Total M Gals.Over Am.Condensers	
41.	B.T.U'S added to cool.Water,Gal.	
42.	Total B.T.U'S into Cooling Water	
43.	" " from Ammonia	
44.	B.T.U'S Taken up by Ammonia	
45.	M Gals. Water Evaporated	
46.	Value per M Gallons	
47.	Total Value Water Lost	
Vacuum Pumps For Steam Condensers		
48.	Total B.H.P.H.Consumed	1456
49.	Cost per B.H.P.H.	\$.00925
50.	Chg.for Steam for Vacuum Pumps .	13.47
51.	Cost of Labor,Supplies,Repairs, Rent and Depreciation	145.49
52.		
53.	Total Cost to Oper.Vacuum Pumps \$	158.96
Steam Condenser Costs		
54.	Lab.to Oper. & Keep Cond. Clean	
55.	Supplies for Oper. of Condenser	
56.	Repairs to Condensers	
57.		
(a)	Total Val.Cond.with all Con. ..	\$ 36275.00
(b)	Rental Chg. per Annum, ...	6% 2176.50
(c)	Depre. " " "	5% 1813.75
(d)	Rental " for Period	334.50
(e)	Depre. " " "	5%\$ 279.50
(f)	Insurance	
(g)	Taxes	
58.	Total of all Stm.Cond'g Costs \$	6228.55
Subdivision Of Steam Condenser Charge		
	Refrigeration, ...	39.7%\$ 2472.74
	Elec.Power and Light, ...	52.1% 3245.07
	Compressed Air, ...	8.2%\$ 510.74

MOTIVE POWER REPORT

SHEET No. 18

CALCULATION OF NET CHARGES TO PLANT

Plant Chicago, Illinois
Report for 8 Weeks Ending February 16, 1918

	STEAM		REFRIGERATION		POWER AND LIGHT				COMPRESSED AIR		WATER			
					POWER		LIGHT				PURCHASED		LOCAL	
	B. H. P. H.	COST	TONS	COST	K. W. H.	COST	K. W. H.	COST	M. CU. FT.	COST	M. GALS.	COST	M. GALS.	COST
Total Net Produced	27607463	25627847	70352	\$234609	1322400	\$23113.91	24100	\$633602	50	\$10442.69	110181	\$2837325	115953	\$4330.00
No. Units used for following:														
Steam					36641	\$557.00	24110	36710	1886	59.40	13260	\$3934.95		
Refrigeration	644665	13213.5			29228	\$510.91	6525	114.06	5660	84.90				
Power and Light	2017000	15657.25					8680	131.94	5670	85.05				
HOUSE LINE	315500	2913.33					1080	17.20	1415	19.05	1750	61.25		
Compressed Air WELLS	360334	3407.09					2160	34.40	2830	38.10	3500	122.50		
Purchased Water	153207	1417.16			12710	227.14								
Local Water	43211	397.70				62.65	3700	58.90	141150	2808.00				
Ammonia Condensers	30000	277.50												
Steam Condensers	10075	3717.34												
VACUUM PUMPS	1156	13.47												
Total for Motive Power	2975248	6021.00			82213	1352.73	12335	623.60	208611	\$3044.50	160510	\$6138.70		
TOTAL TO PLANT	22632215	20425743	70355	\$434609	1322400	\$21761.8	244765	\$9112.43	298439	\$7398.14	304671	\$32234.55	115953	\$4330.75

Credit
5250 918375

METHOD OF CALCULATING

Generation & Transmission of Steam Page 5

1.
 - (a) Number Boilers in Plant
 - (b) Builders' rating x No. of boilers
 - (c) " " x Avg. " "
 - in operation
 - (d) Number hours covered by report x 1(c)
 - (e) 8(a)
 - (f) 1(e) ÷ 1(d)
2. A record is kept each day of the amount and kind of coal consumed.
3. 2 except for oil.
4.
 - (a) Recording thermometer in Boiler House
 - (b) Taken from Power House Daily Record
5. Taken from Boiler Tests
6.
 - (a) Boiler Tests
7.
 - (a) Venturi Charts
 - (b) 7(a) x 6(a)
 - (c) 7(b) ÷ 2(f) x 2000
8.
 - (a) Total Lbs. fuel burned x 5(f or g) ÷ 34.5
 - (b) Obtain according to formula given below for 9(i). 8(b) will ordinarily be 3/2 since exhaust is used for feed water heating.
 - (c) 7(a) + 7(b)
9. If exhaust goes to Heater 1/3 total calculated is taken.
 - (a), (b), (c) Obtained from Pump Sheet
 - (d) For a chain grate this is ordinarily taken as approximately .75% of the total steam generated.
 - (e), (f) Determined by tests
 - (g), (h) Pump Sheet
 - (i) 4(a) - 4(b) x 11(d) x wt. per gallon ÷ 33500 This formula gives the total B.H.P.

H. required for heating feed water and since exhaust is used 9(i) is taken as $2/3$ this amount.

(m) Total for Boiler Room
 $10.8(c) - 9(m)$

11.

(a) $8(a) \times 34.5 \div 6(a) \times \text{wt. per gallon.}$

(b) Estimated

(c) Let $4(a) - 4(b) = D$

Then $11(c) = D(11(a) - 11(b)) \div 1000 + D$

(d) $11(a) - (11(b) - 11(c))$

(e) Water Sheet

(f) $11(d) \times 11(c) \div 1000$

12.

(a), (b), (c), (d) Determined by test or metered.

(g) Cost. 20(b) from preceding report (Electric Power & Light)

13.

(a) Estimated

(b) $13(a) \times \text{cost per M cu.ft. } 15(a) \text{ of preceding period (Air Sheets).}$

14.

(c) Tests

15. Cost of Labor for Operation

16. Supplies and cost

17. Cost of Repairs

18. Rent and Depreciation

$24.23 \div 10$

Refrigeration

Page 10

1.

(n) $1(c) \times 1(l)$

2.

(a) Indicator Cards

(c) $2(a) \times 2(b)$

(d) $1(k) \times 2(c)$

(e) This value is obtained from Curve Sheet 2

(f) $2(d) \div 2(e)$

(g) Obtained from Curve Sheet 5

[Faint, illegible text, likely bleed-through from the reverse side of the page]

- (h) Indicator Cards
 - (i) $2(g) \times 2(h)$
 - (j) Values obtained from average practice.
 - (k) The per cent load on the engine is shown as $2(t)$. By referring to curve 2 on Curve Sheet 11, the factor is obtained.
 - (l) Obtained from Curve Sheet 12.
 - (m) $2(j) \times 2(k) \times 2(l)$
 - (n) $2(m) \times 2(i) \times 24$
 - (o) $2(b) \times 2(n)$
 - (t) $24 \times 2(f) \times 2(i) \div 1(n)$
- Cost of Production of Refrigeration. Page 12
- 3. $2(g) \times$ unit cost of steam
 - 5. Labor Charges
 - 6. Supply Charges
 - 7. Cost of Repairs
 - 8. Portion of Engine Room Lighting.
 - 9. Ammonia Charge
 - 10. This value is transferred directly from 31 of Steam & Ammonia Condensing, page 40.
 - 11. Obtained from Subdivision of Steam Condenser Charge, page 41.
 - 12. Rent and Depreciation.
 - 13.
 - (a) Summation of all Charges.
 - (b) $13 \div 2(f)$
- Distribution of Refrigeration. Page 13
- 14. Labor
 - 15. Supplies
 - 16. Repairs
 - 17. From Pump Sheets
 - 18. From Pump Sheets
 - 19. Number of hours fans run $\times$ K.W. per hour.
 - 20. Amount Brine used.
 - 21. Rent and Depreciation.
 - 25. $24 \div 2(f)$
- Electric Power & Light. Page 16
- 1.
 - (g) $1(c) \times 1(e)$

(h) $1(c) \times 1(f)$

2.

(a) & (b) Metered Readings

(d) $2(c) \div 1(g) \times 100\%$

(e) Obtain from Curve 1 on Curve Sheet 11.

(f) $1.34 \div 2(e)$

(g) $2(c) \times 2(f)$

(h) $2(g) \div 1(h)$

(i) Indicator Cards

(j) Obtained from Curve 2 on Curve Sheet 11.

(k) Curve Sheet 12.

(l) $2(i) \times 2(j) \times 2(k)$

(m) $2(f) \times 2(l)$

(n) $2(c) \times 2(m)$

3. Sum of $2(p) \times$ unit cost of steam.

4. Labor

5. Supplies

6. Repairs

7. Portion of Engine Room Lighting.

8. Subdivision of Steam Condensing Charges,
page 41.

9. Rent and Depreciation.

12.

(a) Total cost.

(b) $12(a) \div 2(c)$

Cost of Power & Light Distribution. Page 18

13. Repairs

14. Labor

15. Supplies

16. Rent and Depreciation

19. Total cost

20.

(a) $19 + 12$

(b) $20 \div 2(c)$

Compressed Air.

Page 20

1.

(h) $1(e) \times 1(g)$

2.

(a) Indicator Cards

- (c) $2(a) \times 2(b)$
- (d) $1(d) \times 2(c)$
- (e) Tests
- (f) $2(d) \div 2(e)$
- (g) $2(f) \div 1(h)$
- (h) Indicator Cards
- (i) Curve 2 Curve Sheet 11
- (j) Curve Sheet 12
- (k) $2(h) \times 2(i) \times 2(j)$
- (l) $2(f) \times 2(k)$
- 3. $2(n) \times$ unit cost of steam
- 5. Labor
- 6. Supplies
- 7. Repairs
- 8. Portion of Engine Room Lighting
- 9. Subdivision of Steam Condenser Charge,
page 41.
- 10. Tests
- 11. Rent and Depreciation
- 15.
- (a) Total cost
- (b) $15(a) \div 2(d)$

Pump Report.

Page 26

- 2.
- (c) $100 - 2(a) \times 2(b)$
- (d) $2(c) \times 1(i)$
- (e) $.00972 \times 2(d) \times 1(j)$
- (f) Tests
- (g) $2(e) \times 2(f)$

Water Report.

Page 37

Purchased Water

- 1. Total Meter Readings
- 2. City Charge
- 3. 1×2
- 4. Pump Sheets
- 5. " "
- 6. $4 \times$ unit cost of steam
- 7. $5 \times$ " " electric power
- 8. Pump Sheets

9.6 + 7 + 8

10.9 + 3

11.10 ÷ 1

Local Water

12.Operation of Wells, 11

13. " " " 17

14.Pump Sheets

15. " "

16.Operation of Wells, 19

17.14 x unit cost of steam

18.15 x " " electric power

19.20 ÷ 12

Operation of Wells.

Page 38

10.Tests

11.60 x (9) x (10)

Steam & Ammonia Condensing.

Page 39

4.Taken from Power House Daily Record

6.Total B.H.P.H. used by engines.

7.6(g) x 32.8 ÷ 1000

8.950 ÷ 4(i) ÷ Lbs.per gallon Water

9.7 x 8

Water over Ammonia & Steam Condens-
ers Separately.

Page 40

These items are taken from Pump Sheets and
proper unit costs applied.

Vacuum Pumps for Steam Condensers. Page 41

48.Pump Sheets

49.Unit cost of steam

Steam Condenser Costs.

Page 41

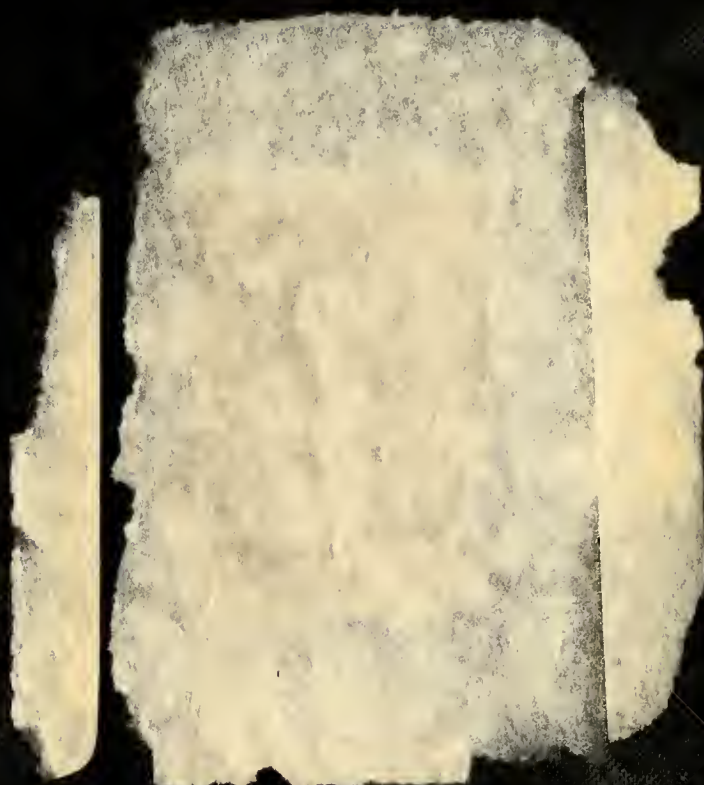
Rent and Depreciation + Steam Condenser

Charges + Pumping + Vacuum Pumps.

Subdivision of Steam Condens-
er Charges.

Page 41

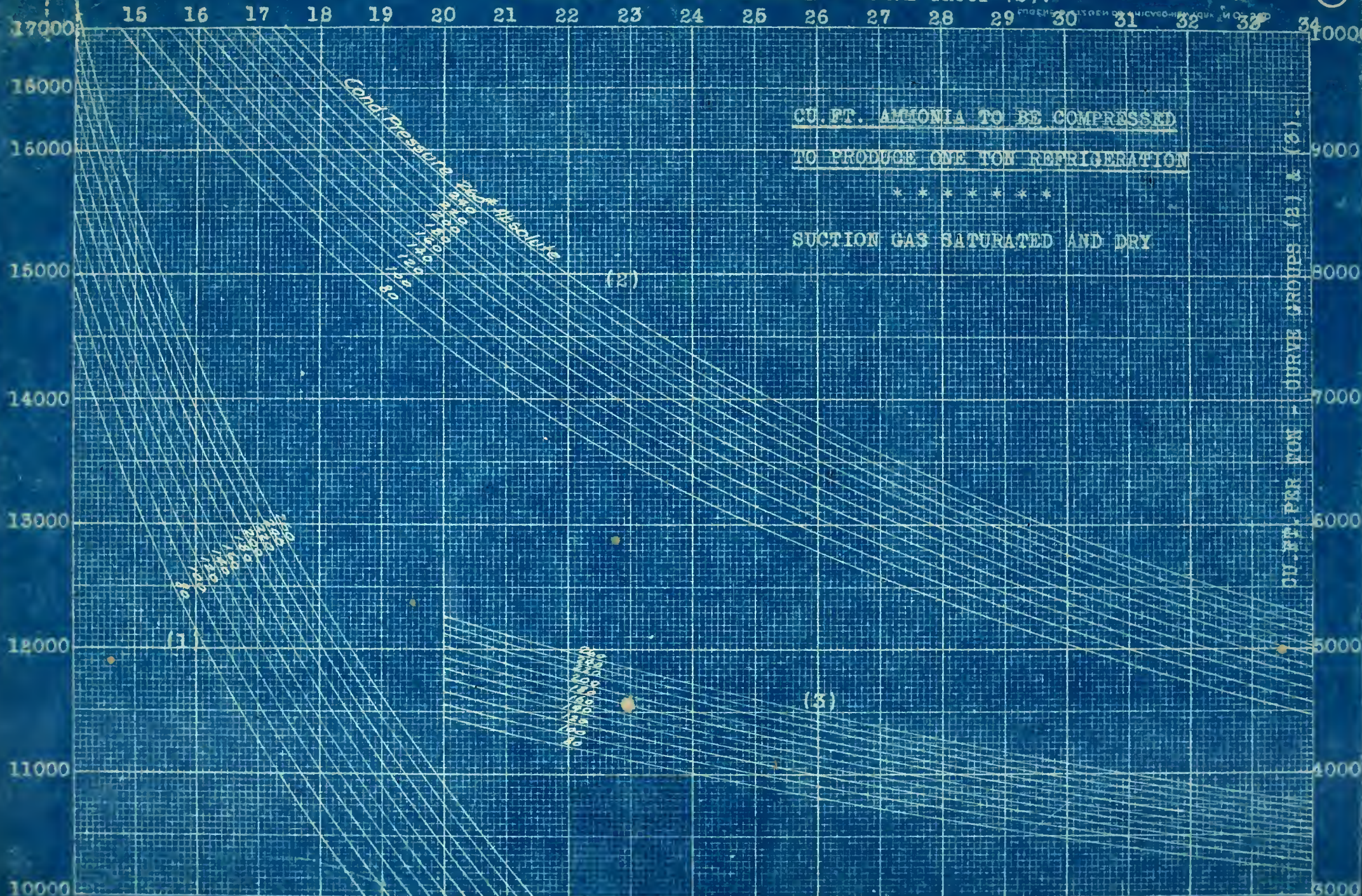
Percentage of 6. steam condensed applied to
Steam Condenser Costs



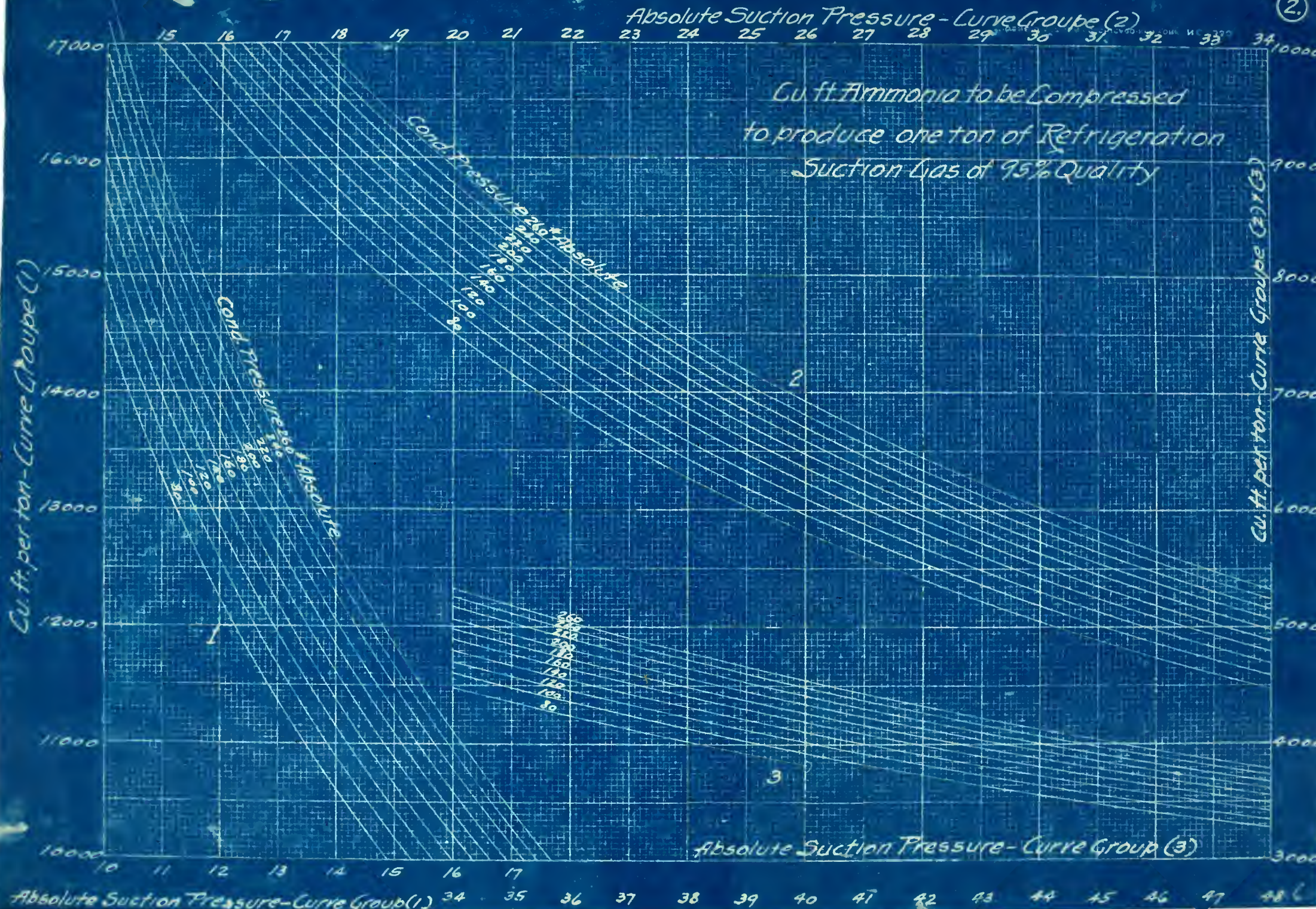
ABSOLUTE SUCTION PRESSURE - CURVE GROUP (2).

(7)

CU. FT. PER TON - CURVE GROUP (1).



ABS. SUCT. PRKS. - CURVE GROUP (1). 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48



Cu. ft. Ammonia to be Compressed
to produce one ton of Refrigeration
Suction Gas of 95% Quality

Absolute Suction Pressure - Curve Group (3)

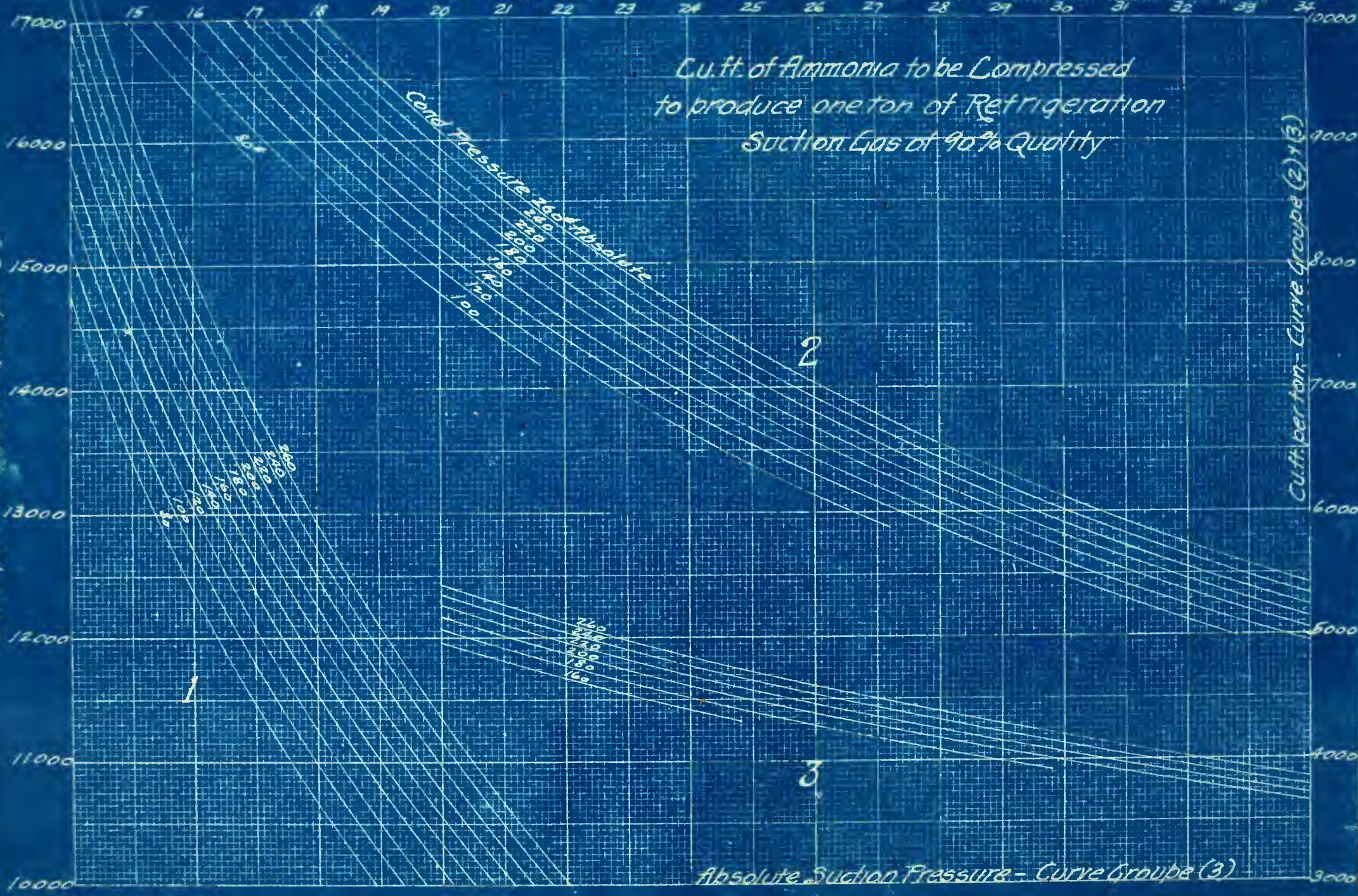
Absolute Suction Pressure - Curve Group (1)

Absolute Suction Pressure - Curve Groups (2)

Cu. ft. of Ammonia to be Compressed
to produce one ton of Refrigeration
Suction Gas of 90% Quality

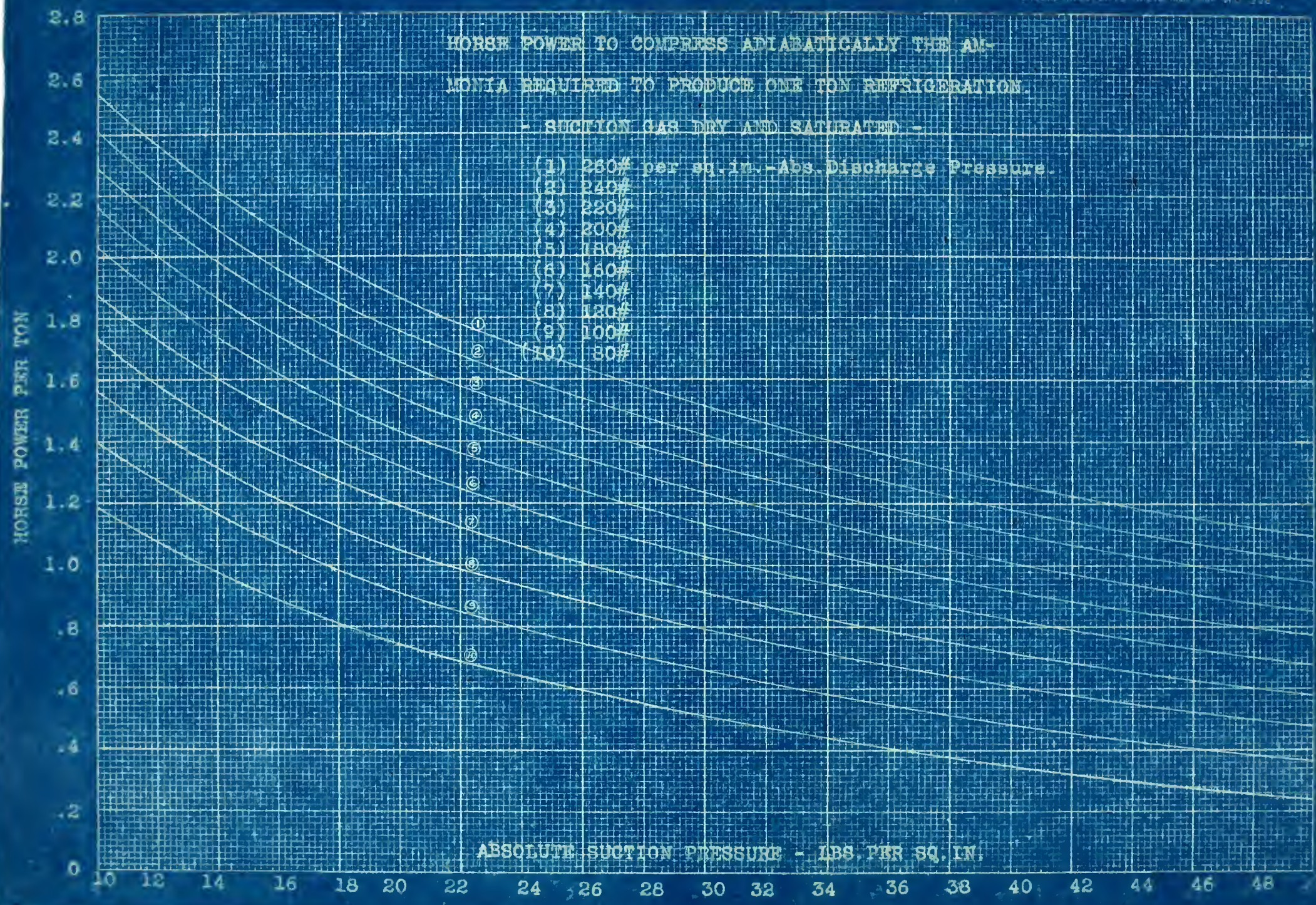
Cu. ft. per ton - Curve Groups (1)

Cu. ft. per ton - Curve Groups (2) & (3)



Absolute Suction Pressure - Curve Groups (3)

Absolute Suction Press. Curve Groups (1)



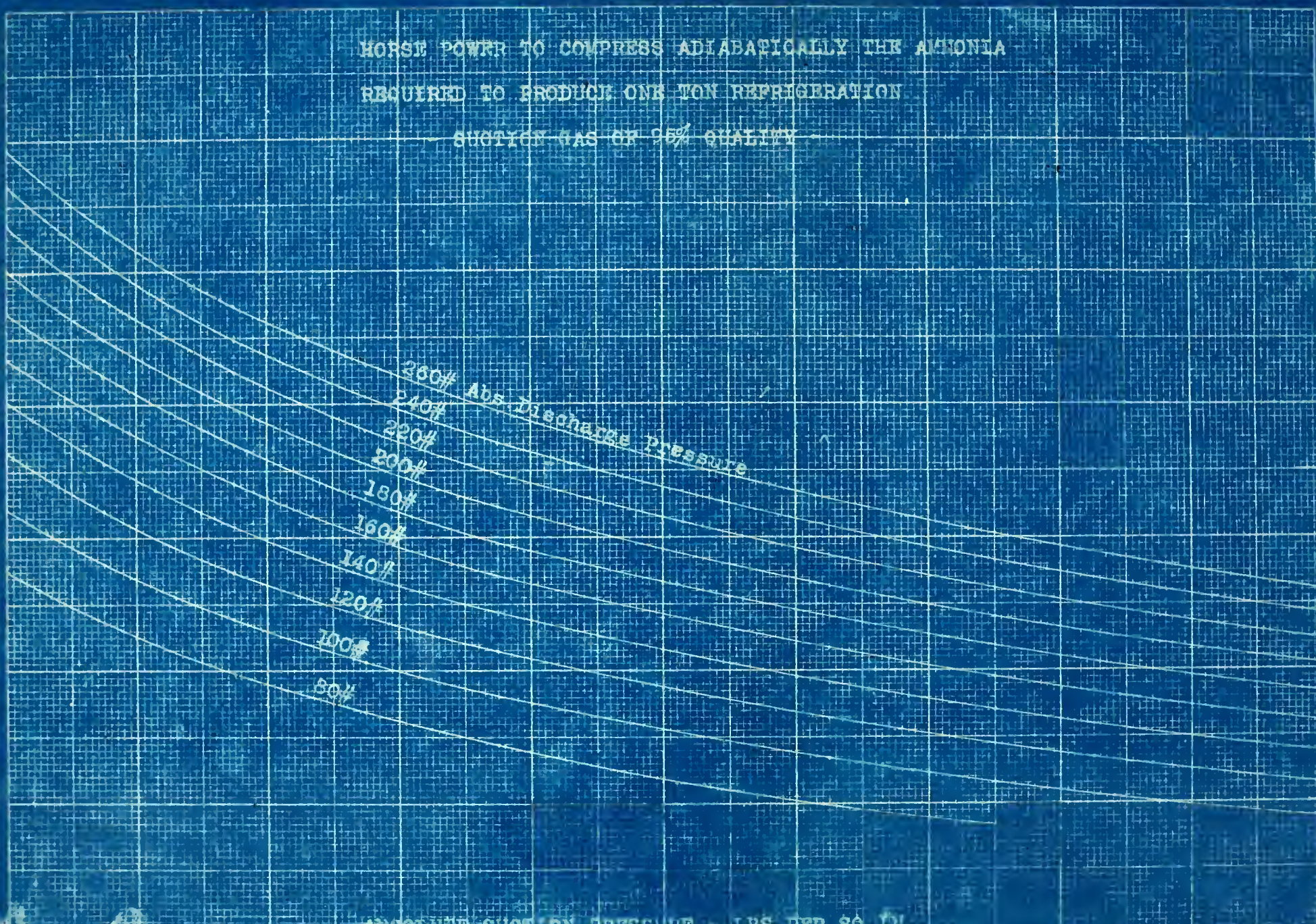
HORSE POWER TO COMPRESS ADIABATICALLY THE AMMONIA
REQUIRED TO PRODUCE ONE TON REFRIGERATION
SUCTION WAS OF 95% QUALITY

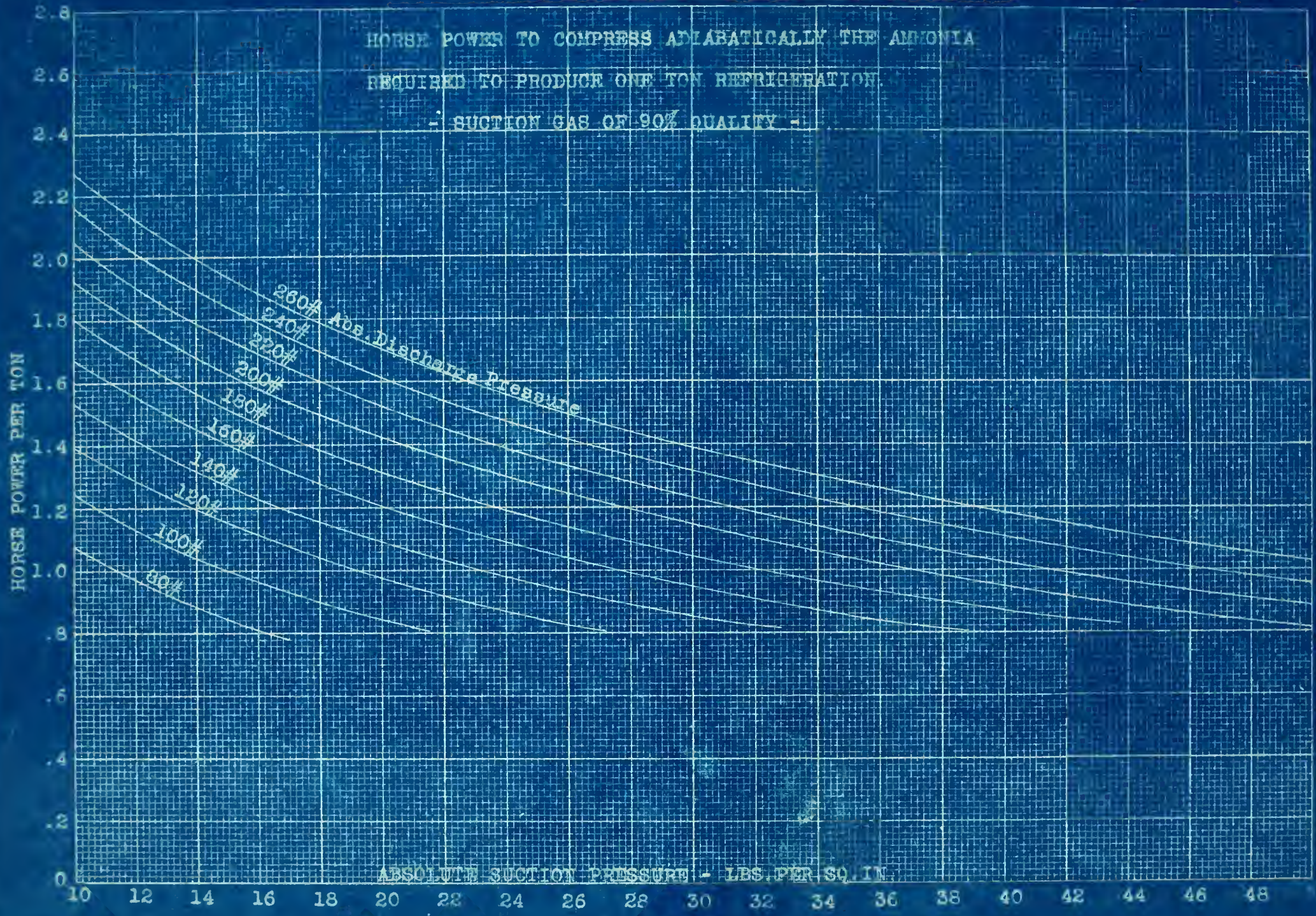
HORSE POWER PER TON

260# Abs. Discharge Pressure
240#
220#
200#
180#
160#
140#
120#
100#
80#

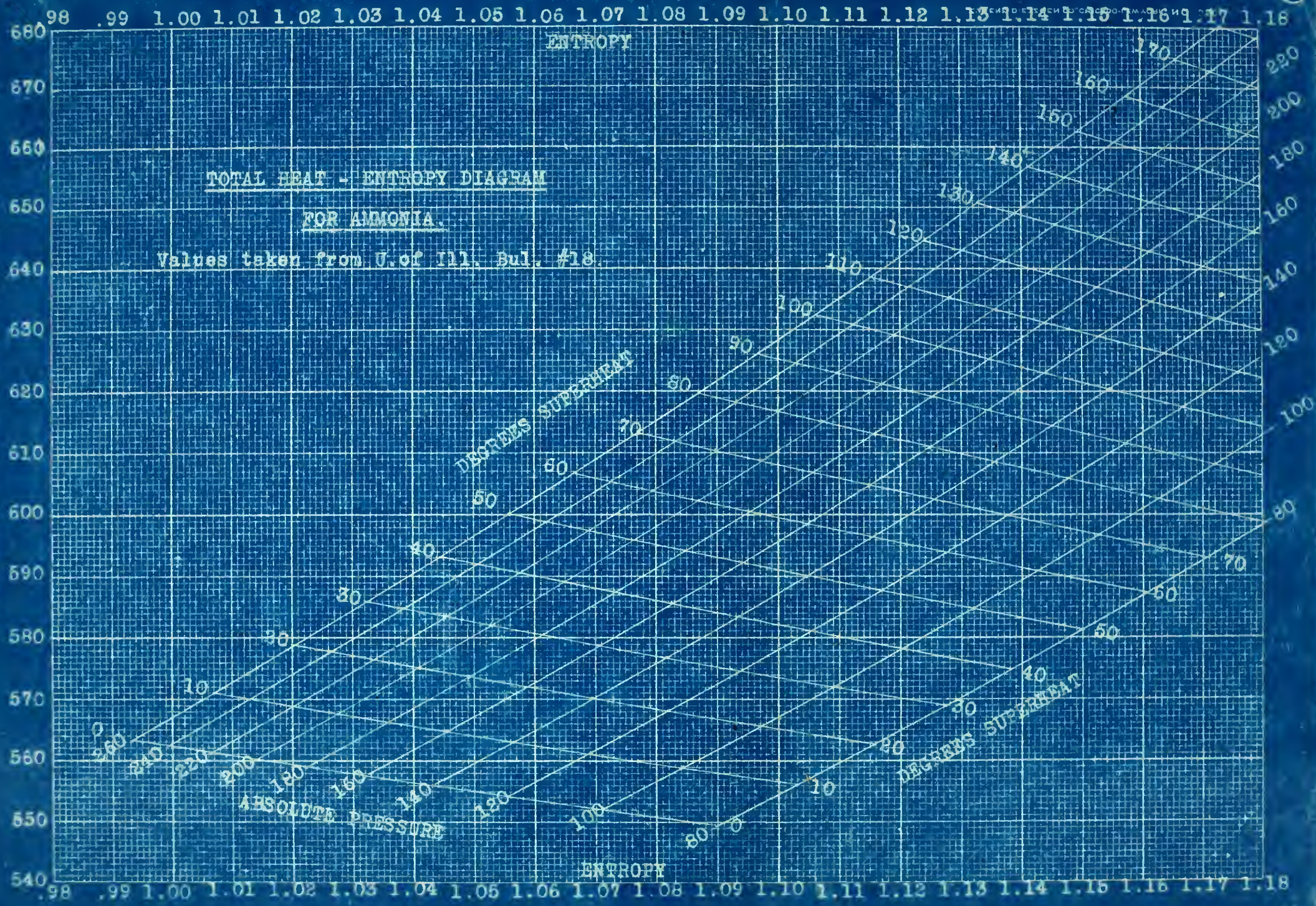
ABSOLUTE SUCTION PRESSURE - LBS PER SQ. IN.

10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50

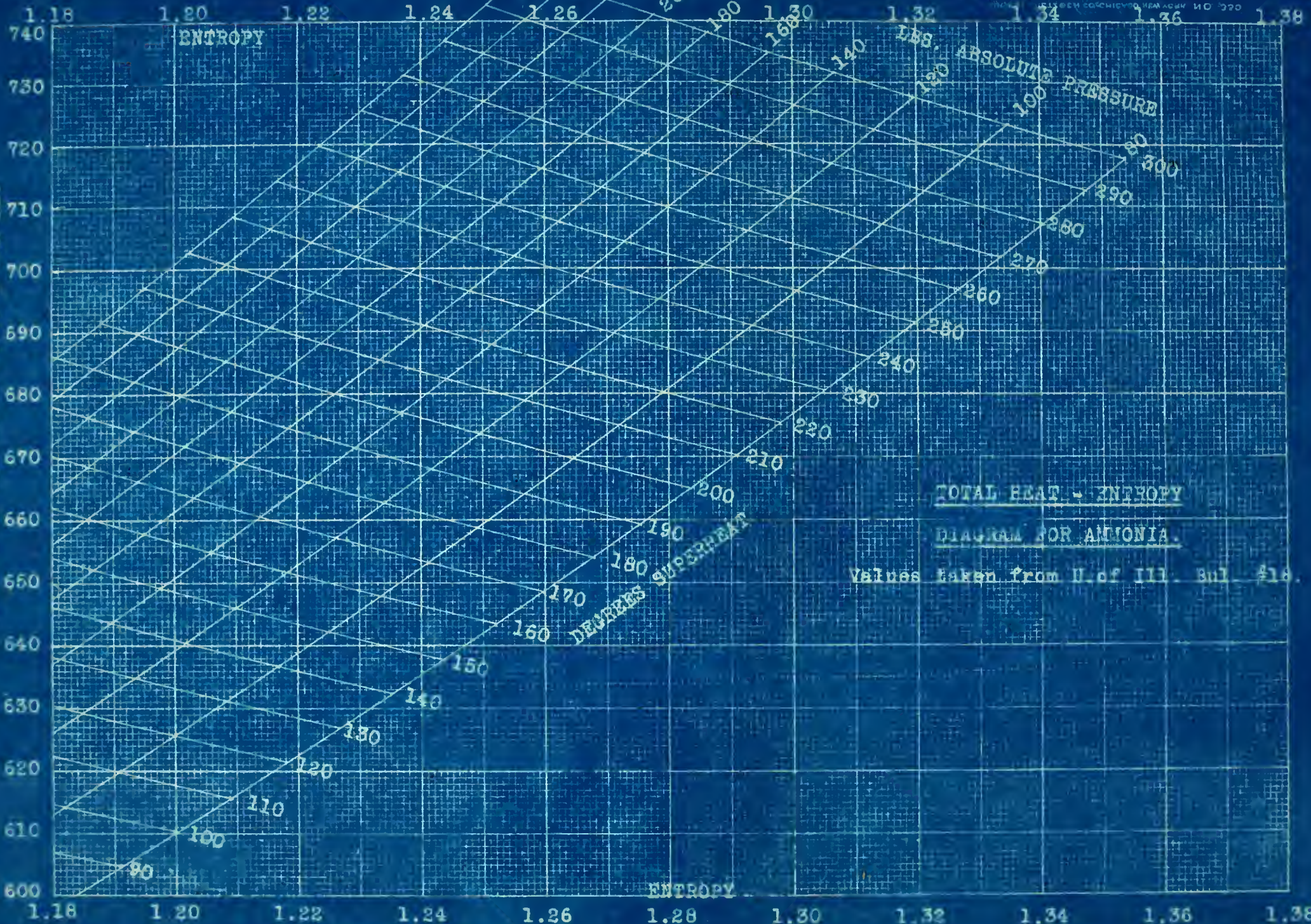


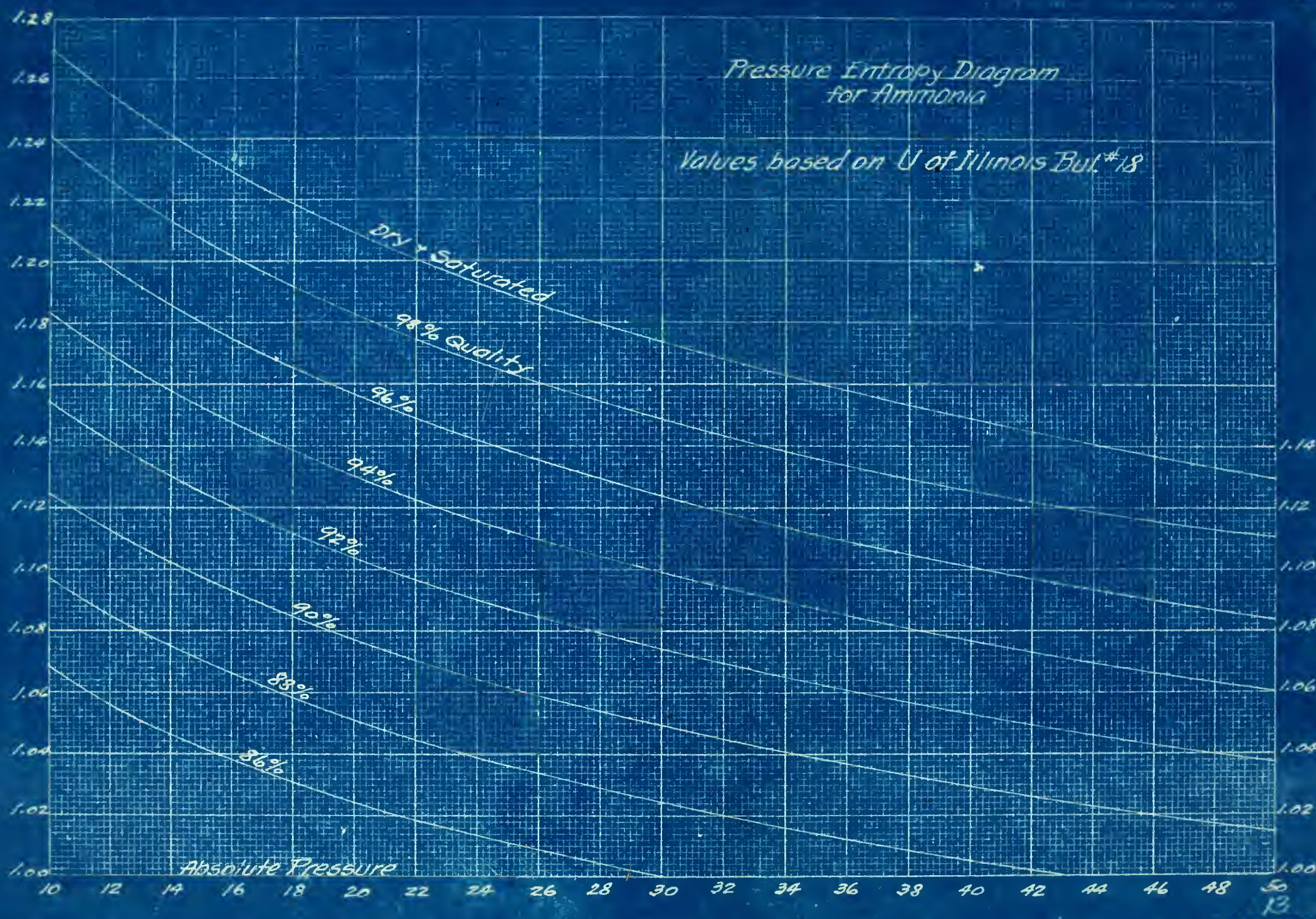


TOTAL HEAT CONTENT - B.T.U.'S. PER LB.

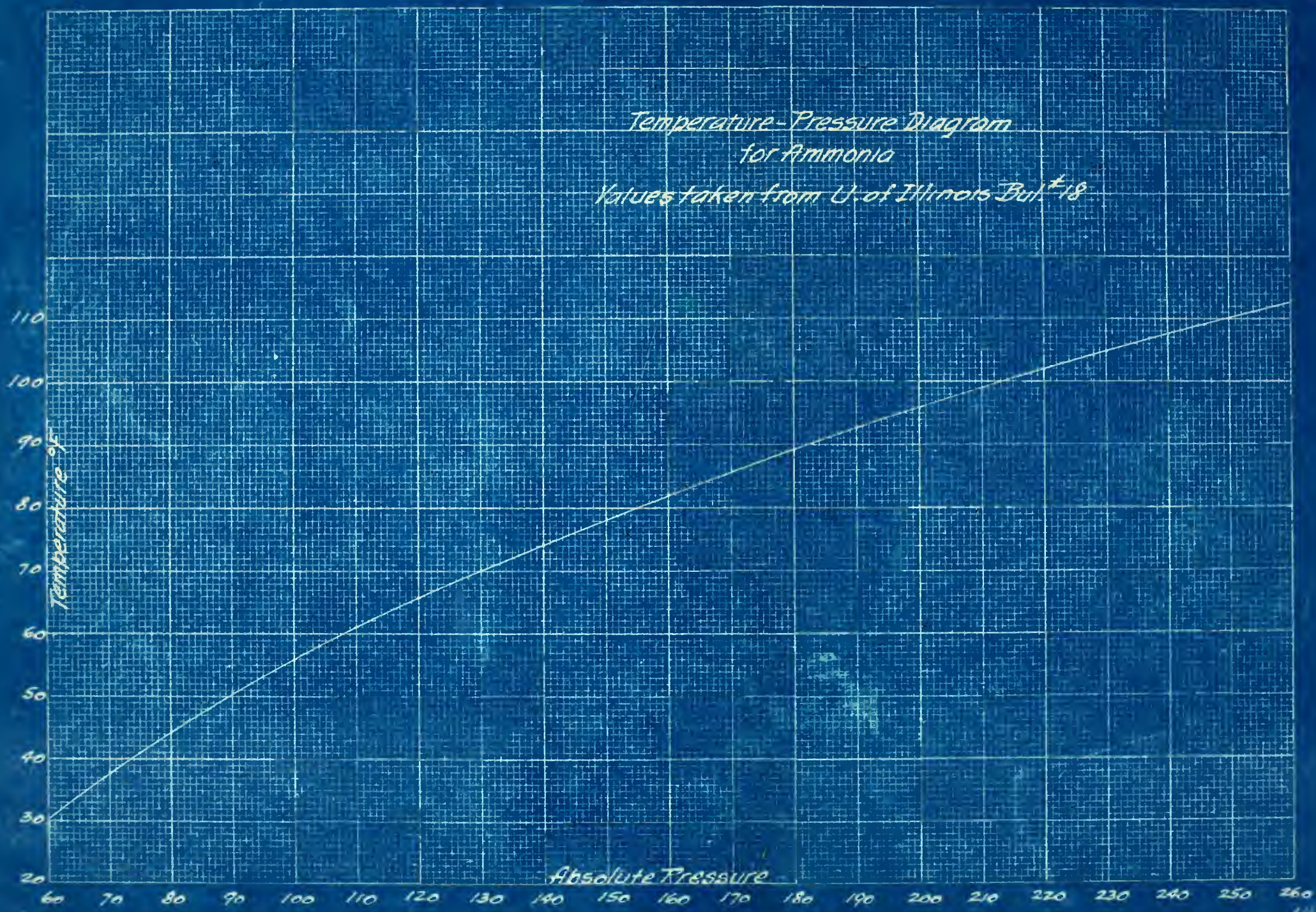


TOTAL HEAT CONTENT - B.T.U.'s PER LB.





Temperature-Pressure Diagram
for Ammonia
Values taken from U. of Illinois Bul. #18

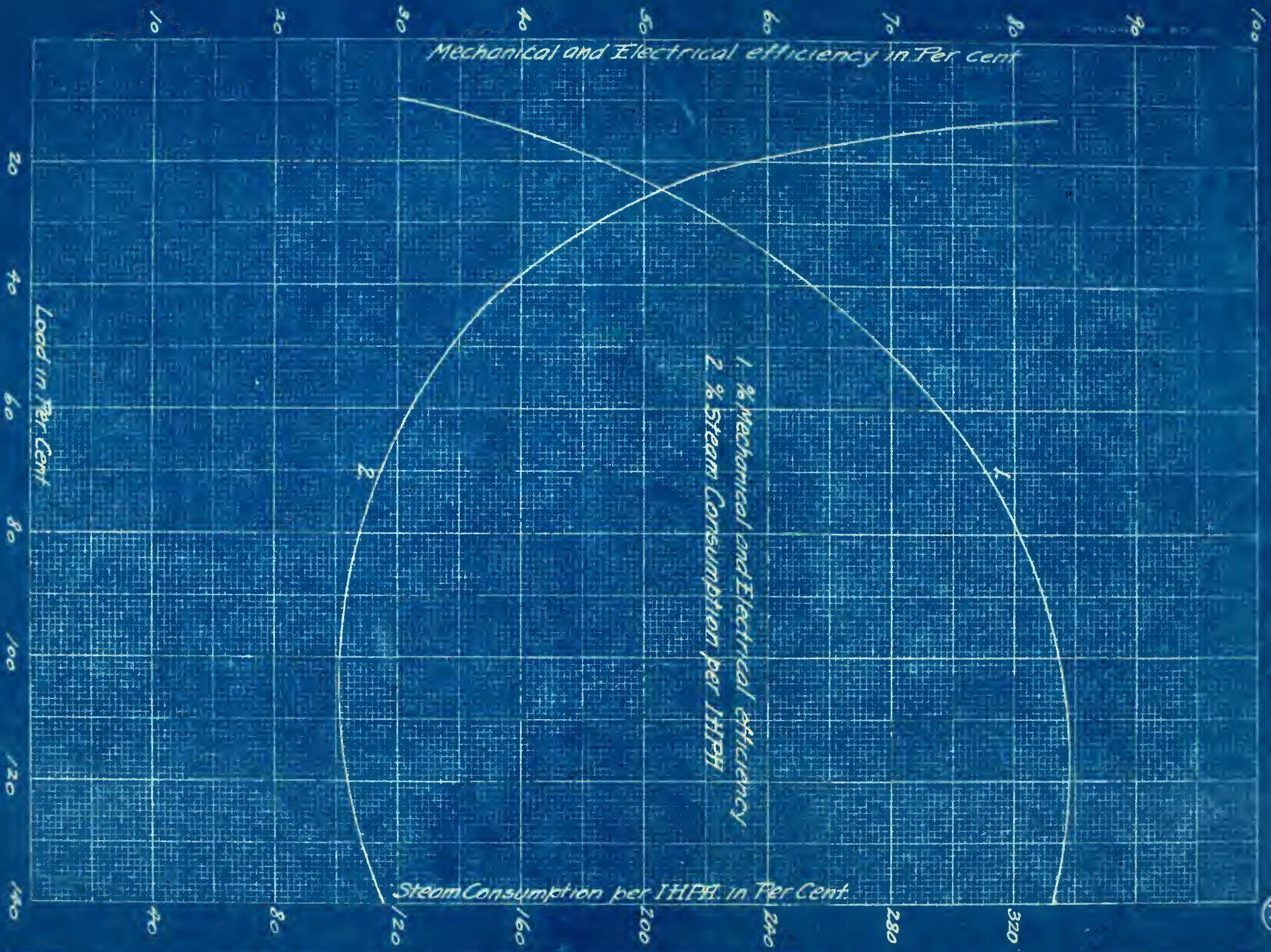


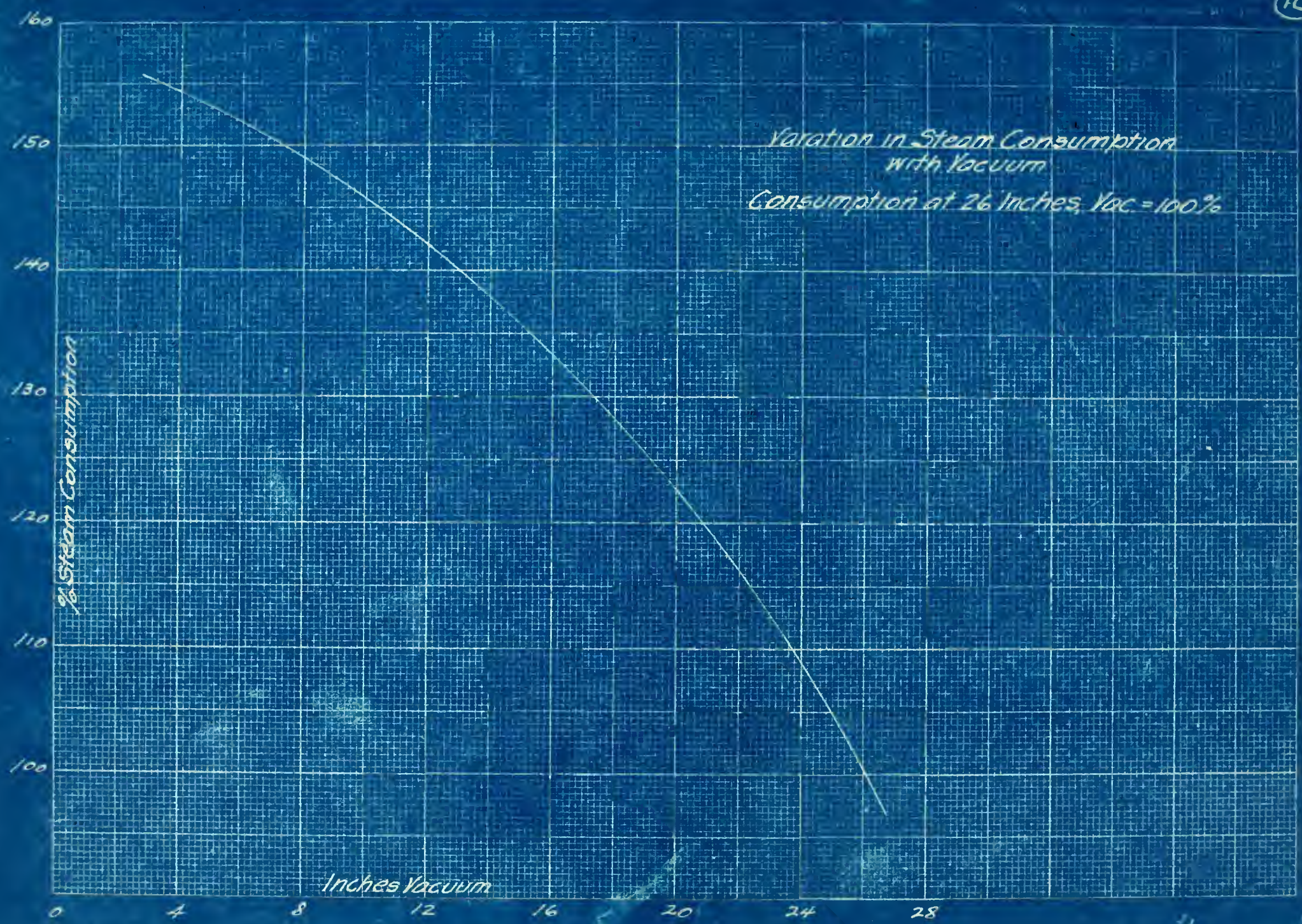
Mechanical and Electrical efficiency in Per cent

1. % Mechanical and Electrical efficiency
2. % Steam Consumption per IHPH

Steam Consumption per IHPH in Per Cent

Load in Per Cent





One Ton Refrigeration Equals 288,000 B. T. U.'s

Plant

Weeks Period Ending Feb. 16

191 8

Form 981-BN 2M sheet 3 8413 151285

REFRIGERATION FOR CHILLING PRODUCT						REFRIGERATION FOR HOLDING					TOTAL TONS FOR DEPT.	DISTRIBUTION	Corrected Tons Per Unit	CHARGE PER UNIT	
DEPT No.	DEPARTMENT	DISTRIBUTION UNIT	NUMBER OF UNITS	RATE : TONS PER UNIT	FIRST EXTENSION TONS	Equivalent Cu. Ft. under Refrigeration	TEMP. DELB AT	CU. FEET PER TON	Calculated Tons for Holding	Corrected Tons for Holding					
6-1A	Packing Hogs	Tons Dressed, Weight	26126												
6-1A	" "	" Product Saved													
6-2A	Shipping Cattle	" " "	1262	36	456	105378	35	7220	12	76	492	33380			
6-2B	" Sheep	" " "	85	36	31	40	32	6700	0		31	2104			
6-2C	" Hogs	" Dressed, Weight	4144												
6-2C	" "	" Product Saved													
6-2D	" Calves	" " "	72		26	9350	35	7220	35		81	2004			
12-16	Bf Ent. mfg	Tons Transferred In	6098			13700	35	7220	2		11	1493			
6-3	Bf Cuttery														
10-15A	Ice House														
10-15D	Ice Manufacturing Plant	Tons Ice Manufactured													
10-17	Office														
10-18	Packing and Shipping														
10-24	Restaurant (Hotel)														
12-2C	For mfg		333			22262	36	4000	3	11	16	1086			
12-1A	Dressed Beef	Tons Transferred In	2517			5452	36	4000	1	5	5	339			
12-1B	" Sheep	" " "	41												
12-1C	" Hogs	" " "	1024			5300	30	3790	1	16					
12-1D	" Calves	" " "	369			5326	35	7220	8	13	92	6242			
12-2	Canned Meats - Mtd	" Manufactured	6488												
12-1A	S. P. Meat	" Put Down	282	2		23530	36	9000	3	11	72	2885			
12-1B	Boiled Ham	" Transferred In	624	1		431516	36	9000	50	72	334	22620			
12-1C	Barreled Poul.	" Packed	2553												
12-1D	Dry Salt Meats	" Put Down	1123												
12-1E	Beef Curing	" Packed	2120	75	1596	80618	38	2000	8	16					
12-7A	Refined Lard	" "	4			86245	50	200000	0		1612	09800			
12-7B	Kettle Rendered Lard	" "	2314	85	2025	80618	38	2000	3	6					
12-7C	Lard Substitutes	" "	1200	3	422	86285	38	200000	0		2041	31400			
12-7D	Tallow and Grease	" "	206			53208	40	17000	9	4	471	31150			
12-8A	V. P. Pork Products	" Cured	959			1629	35	7220	1		5	339			
12-8B	Beef Casings	100 Head Killed less Cnd., Sls	1281			8161	35	7220			5	339			
12-8C	Sheep Casings	100 " " " " " "	322			7418	35	7220	2	22	22	1493			
12-8E	Hog Casings	100 " " " " " "													
12-8F	V. P. Beef Products	Tons Cured	217	2	43	2216	35	7220	10		17	6685			
12-9A	Fresh Sausage	" Manufactured	2717	12	443	25674	35	7220	30	53	606	41130			
12-9B	Dry Sausage	" "	837			1129	38	12000	7	35					
12-10	Hides	100 Hides Put Down	1443			62130	33	5500	12						
12-11A	Butterine--Manufactured	Tons Manufactured	217	15	4475	188440	63	288000			1599	108500			
	" For Sales	" Received				36000	52	200000	2						
12-11C	Gine	" Manufactured				49420	40	17000	2	16					
12-12A	Oleo	" "	2137		427	81804	60	225000	0		127	28950			
12-12B	Neutral	" "				23660	60	225000	0						
12-13	Albumen	" "													
12-15A	Fresh Beef Cuts	" Received	2103			22710	38	12000	2	11	11	747			
12-15B	Fresh Pork Cuts	" "	4276												
12-16B	Soda Fountain Supplies					46871	26	2250	2	109	109	7396			
12-17	Pepsin		49825			7350	35	7220		5	5	239			
12-18	Mince Meat	Tons Manufactured	165												
12-19A	Butter	" Received	1006												
12-19B	Eggs	" "	395												
12-19C	Poultry	" "	489												
12-19D	Cheese	" "	396		79	86	34	6000	5	82	161	10925			
12-19E	Storage	" "													
	FERTILIZER WORKS														
	Albumen	Tons Manufactured			481	20	42	27000		5	491	33320			
	WHOLESALE MARKET														
	RETAIL MARKET					17850		6000	3	16	16	1080			
	TOTAL														
	TOTAL TONS REFRIGERATION PRODUCED														
	Tons Used by Tenants														
	Tons Distributed to Departments														
	CHARGE PER TON DISTRIBUTED														

MOTIVE POWER DEPARTMENT

Distribution of Refrigeration Charges

Plant

One Ton Refrigeration Equals 288,000 B. T. U.'s

Weeks Period Ending

191

Form 284 (Rev. 2-21-14) Sheet 4 of 4 107285

DEPT No.	DEPARTMENT	DISTRIBUTION UNIT	NUMBER OF UNITS	RATE: TONS PER UNIT	FIRST EXTENSION TONS	REFRIGERATION FOR CHILLING PRODUCT					REFRIGERATION FOR HOLDING					TOTAL TONS FOR DEPT.	DISTRIBUTION	Corrected Tons Per Unit	CHARGE PER UNIT
						CU. FEET UNDER REFRIG'N	TEMP. HELD AT	CU. FEET PER TON	Calculated Tons for Holding	Corrected Tons for Holding	CU. FEET UNDER REFRIG'N	TEMP. HELD AT	CU. FEET PER TON	Calculated Tons for Holding	Corrected Tons for Holding				
					7539	182480					1197	8.82	576427						
6 1a	Packing Hogs	Tons dressed Hg Product Saved	2646	.37 2	8370	65300 70064 11160 6052	30 32 35 38	3790 4700 7220 12000	437 15 6 1	2495	10365	137200							
6 2a	Shipping Hogs	Tons Product Saved	4	.36	157	6850	35	7220	1	5	162	10930							
8	Freezer	Tons Trans In	6098	8	4870	692633 51659 16416	7 0 3	200 280 325	3464 184 51 2699	20110	24980	1695500							
10 1b	Pkg & Shpg.					16168 18777	35 38	7220 12000	22 15 37	2.01	201	13635							
12-1a	Dressed Beef	Tons Beef	244	.2	4883	10410 84513 89760 34560 100000 200000 100000	32 38 18 28 15 32 32	4700 1200 1000 2700 330 4700 4700	256 7 40 13 182 43 22 613	3330	8213	557100							
12-1a	Dressed Beef	"	2547	.2	509	39700 6760 11600 45032 45960	18 38 32 36 34	1000 2700 6000 9000 1370	40 2 15 5 7 66	359	868	10900							
12-1a	Dressed Hogs	"	44	.2	82	27120 1804 62530 367800 31420	18 28 34 36 39	1000 2700 6000 9000 1375	27 2 10 34 2 14	402	404	12800							
12-1a	Dressed Cows	"	1024	.2	205	0700 2250 24650 12140 12250	18 28 34 36 40	1000 2700 6000 9000 17000	0 1 1 1 1	72	247	20100							
12-1a	Shipping Beef	Tons Put Down	647	.2	1300	235163 21233 671306 330425 106050	38 36 36 30 20	1000 1000 6000 8790 2000	24 242 112 87 53 518	2814	4	19200							
12-1a	By Salt Meats	"	243	.2	511	2190 35 16106	36 38 40	400 1700 1700	25 40 4 24			6920							
12-1a	By Curing	" Packers		.2	203	240171 247215 312047	36 35 37	9000 7220 10000	27 34 31 42	500	705	47840							

6 2571 2407 6036 41117

MOTIVE POWER DEPARTMENT

Distribution of Refrigeration Charges

One Ton Refrigeration Equals 288,000 B. T. U.'s

Average Outside Temperature for Period

Plant

Weeks Period Ending

191

Form 301 R. 2M Sheet 1 8-4-1915

DEPT No.	DEPARTMENT	REFRIGERATION FOR CHILLING PRODUCT				REFRIGERATION FOR HOLDING				TOTAL TONS FOR DEPT.	DISTRIBUTION	Corrected Tons Per Unit	CHARGE PER UNIT
		DISTRIBUTION UNIT	NUMBER OF UNITS	RATE: TONS PER UNIT	FIRST EXTENSION TONS	CU. FEET UNDER REFRIG'N	TEMP. HELD AT	CU. FEET PER TON	Calculated Tons for Holding	Corrected Tons for Holding			
					28 679				5871	3087	60586	4111702	
1277	Kettle Brand Pork	Tons Packed	347	.85	29	65234	45	54000	1	5	299	10070	
1280	U. B. Pork Prod	Tons Cured	06	2	41	19745	32	4700	5	71	112	7600	
						58618	35	7220	8				
									13				
1281	Butt Slicing								0				
1282	dry Sausage	Long Slicing			225	127030	30	3790	34	300	715	48530	
						167190	34	6000	28				
						37350	35	3220	5				
						33264	38	12000	70				
1283	Butt Packed	Long Slicing				7020	38	15000	15	332	332	2530	
						3026	36	9000	0				
						6067	20	1328	46				
									61				
	Butt of Butts	"	2100			21600	38	12000	2	1	11	747	
1284	Butt		1006		201	9220	0	280	33	1213	141	95930	
						89745	8	475	189				
						5511	15	54000	1				
1285	Butt				51	48877	30	3790	223	381	460	61110	
						36883	0	280	132				
						4010	11	1000	17				
									162				
					88	24632	0	280	184	4985	508	244962	
						27313	0	280	185				
						19441	6	210	428				
									417				
						10618	26	2200	7	38	38		
						60151	20	200	30				
						12440	30	1000	20				
						599686	35	7220	1	800	805	54650	
						67675	16	1000	1				
									10000				
									20000				
1286	Pork Beans	Long Slicing											

29721

41628 7035 47742

Distribution of Steam Charges

One Boiler-Horse-Power-Hour Equals 34.5 Lbs. Steam from and at 212° F.

Form 8-01-AN 2M Sheet 1-8-18-1915-5

DEPT No.	DEPARTMENT	DISTRIBUTION UNIT	NUMBER OF UNITS	RATE: B. H. P. H. PER UNIT	FIRST EXTENSION B. H. P. H.	STEAM FOR HEATING		TOTAL B. H. P. H. FOR THE DEPARTMENTS		DISTRIBUTION	Corrected H. H. P. H. Per Unit	CHARGE PER UNIT
						Sq. Feet Heating Surface	B. H. P. H.	CALCULATED	CORRECTED			
3	Puffer Boilers				250			250	665	664		
					250			250	665	664		
					250			250	665	664		
					250			250	665	664		
6-1A	Packing Hogs	Tons Dressed Weight	26146	85	2225 000	1300	20800	2245 800	5 977 198	59 658 41		
6-1B	Trans. Plate Products	Trans. Plate Cut										
6-2A	Shipping Cattle	" Dressed Weight	24414	15	36621	785	12 574	49 164	130 820	130 571		
6-2B	" Sheep	" " "	2547	98	24950	260	4100	29 110	77 500	77 350		
6-2C	" Hogs	" " "	414	258	10 690	30	480	11 170	29 740	29 660		
6-2D	" Calves	" " "	1024	27	2778	113	1868	4586	12 205	12 190		
6-3	Beef Cutting	" " Received				242	3872	3872	10 300	10 280		
6-4A	Poultry Killing	" Dressed Weight										
6-4B	Packing	" Packed										
	Gymnasium				600	2258	18 064	18 664	49 690	49 586		
	Garage					190	7920	7 920	21 080	21 003		
7-1	Hog Tanks	Tons Production	4220	70	295 000	154	2 464	297 464	791 700	790 186		
7-2	Beef Tanks	" "	623	500	311 500	15	240	311 740	829 696	828 120		
	Ice Tanks				21 100			21 100	56 160	56 005		
8	Freezer	Tons In				27	432	432	1 150	1 148		
						200	3200	3208	8 520	8 510		
10-1	Machine Shop					2430	38800	38800	103 500	103 250		
10-2	Carpenter Shop					322	5152	5152	13 710	12 695		
10-3	Masons and Bricklayers					45	720	720	1916	1913		
10-4	Paint Shop					145	2340	2340	5960	5950		
10-5	Tin Shop	Tons Tin Plate Cut			200 000	3106	49 696	249 696	664 560	663 303		
10-8	Laundry and Sewing				100 000			100 000	266 150	265 900		
10-9A	Cooper Shop	100 Old Tierces In			60 000	82	1312	61 312	163 150	162 900		
10-9B	Box Factory	1000 ft. Lumber Used				381	9296	9 246	24 740	24 740		
10-9C	Cooperage Manufacturing	100 1/2 Barrels Mfg			16 000	248	3464	19 168	53 150	53 050		
10-11	Store Room					72	1152	1 152	3065	3066		
10-14A	Stables					296	4736	4 736	12 605	12 585		
10-14B	Wagon Shop					311	8176	8 176	21 760	21 720		
10-14C	Harness Shop					200	3200	3 200	8 520	8 502		
10-14D	Horse Shoeing Shop					34	864	864	2 300	2 296		
10-14E	Automobiles					1005	16 080	16 080	42 800	42 720		
10-15A	Ice House											
10-15B	Beef House Icing	Tons Ice Used				36	576	576	1 510	1 530		
10-15C	Packing House Icing	" " "										
10-15D	Ice Manufacturing Plants	" " Manufactured										
10-16	Stationery											
10-17	Office											
10-18	Packing and Shipping				142 500	748	11 468	11 968	31 850	31 800		
10-19	Elevated Railroad							142 500	379 400	378 600		
10-20	Railroad Tracks				16 000	325	5200	5200	13 845	13 800		
10-21A	St. Cleaning and Crematory					210	3360	19 360	51 550	51 460		
10-21B	Paper Baling											
10-22	Police											
10-23	Fire					30	1 280	1 280	3 407	3 401		
10-24	Restaurant					136	2176	2 176	5 740	5 780		
10-25	Milling	Cwt. Milled			16 000	35	560	16 000	42 600	42 520		
10-27	Laboratory					312	4992	560	14 900	14 866		
10-29	Ice Cases	100 Cases Received			6 000			10 942	29 850	29 200		
	Restaurant (Old)				1 500	103	648	9 148	8 380	8 353		
FERTILIZER					551 033			551 033	1 466 574	1 463 788		
GAZES						154	2 544	2 544	6 770	6 750		
PRINTING WORKS						1060	17 115	23 920	67 800	67 670		
WHOLESALE MARKET						321	5 120	5 120	13 625	13 600		
RETAIL MARKET								3664	9 755	9 750		
		Carried Forward				228 424	4 328 755	11 519 930				

PLANT

One Boiler-Horse-Power-Hour Equals 34.5 Lbs. Steam from and at 212° F.

Weeks Period Ending

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Accession 99.01 AN "M" Sheet 1st 8.1.13 15758

DEPT No.	DEPARTMENT	DISTRIBUTION UNIT	NUMBER OF UNITS	RATE: B. H. P. H. PER UNIT	FIRST EXTENSION B. H. P. H.	STEAM FOR HEATING		TOTAL B. H. P. H. FOR THE DEPARTMENTS		DISTRIBUTION	Corrected B. H. P. H. Per Unit	CHARGE PER UNIT
						Sq. Feet Heating Surface	B. H. P. H.	CALCULATED	CORRECTED			
12-20	Pork & Beans	Tons Mfg	333	57.5	4 039 831			14 100	11 519 930	11 498 138		
12-24	Pork & Butter	Tons Transferred In	24 414		19 100	23	386	568	50 850	50 750		
12-1A	Dressed Beef	" " "	2547						480	479		
12-1B	" Sheep	" " "	414									
12-1C	" Hogs	" " "	1024									
12-1D	" Calves	" " "	4369	253.5	118 000	428	70848	1 250 848	3 321	3 322 807		
12-2	Canned Meats-Mfg	" Manufactured	2408	6.5	28 300	145	2 320	30 620	81 530	81 500		
12-3A	Smoked Meats	Tons to Smoked	438	12.5	60 100	914	14 624	74 724	198 800	198 350		
12-3B	Dried Beef	" " "	6498	5	54 750	101	16 6	36 366	150 000	149 700		
12-4A	S P Meats	" Put Down	282	300	32 490	117	1872	34 362	91 500	913 20		
12-4B	Boiled Hams	" Transferred In	624	0	84 600	3120	24	384	84 600	225 100		
12-4C	Barreled Pork	" Packed	2533	10	3 120	24	384	3304	9 330	9325		
12-5	Dry Salt Meats	" Put Down	1023	40	25 330	5	80	23 610	68 160	68 000		
12-6	Beef Curing	" Packed	2128	40	40 120	52	832	41 752	111 150	111 300		
12-7A	Refined Lard	" " "	1454	3.5	85 120	477	7632	12 752	246 400	246 000		
12-7B	Kettle Rendered Lard	" Steamed Out Cars	347	40	5 085			5 085	15 535	135 20		
12-7C	Lard Substitutes	" Packed	2384	14.5	13 880	109	200	16 424	43 700	43 620		
12-7D	Lard and Grease	" " "	1409	5	35 300	472	7552	60 552	95 786	95 786		
12-7E	Cotton Oil Refining	" Steamed Out Cars	592	3.5	56 360	318	5088	61 448	163 500	163 300		
12-8A	V P Pork Products	" Refined	1717	0	2070	159	2544	2 075	55 08	55 00		
12-8B	Beef Casings	" " "	2324	3.5	17 170			14 714	52 480	52 380		
12-8C	Sheep Casings	" Steamed Out Car-	206	11.5	8 140			8 140	21 660	21 640		
12-8D	Gut Strings	" Cured	759	106	23 700	150	2400	26 100	61 450	61 310		
12-8E	Hog Casings	100 Head Killed less Cml. Sds	1287	14	101 654	37	592	102 246	272 128	271 600		
12-8F	V P Beef Products	100 Head Killed less Cml. Sds	344	5	8 000	463		15 403	41 000	40 920		
12-9A	Fresh Sausage	Tons Cured	217	200	17 070	20	320	17 403	46 290	46 200		
12-9B	Dry Sausage-Mfg	" Manufactured	2217	100	43 400	150	2400	45 800	121 850	121 600		
9	Stevia & Sals	" " "	837	300	22 700	125	2000	23 700	545 378	545 00		
12-10	Hides	" " "	14		251 100	1266	20 256	271 356	722 410	720 842		
12-11A	Butterfat-Mfg	100 Hides Put Down	1043									
12-11B	Butterfat-Mfg	Tons Manufactured	2277	00	113 800	4816	77056	100 906	508 000	507 000		
12-11C	Beef Extract Mfg	" " "			40 000	525	8416	48 416	128 800	128 600		
12-11D	Gluc	Tons Manufactured										
12-12A	Oleo	" " "	2137	72	155 360	1750	28 000	81 864	484 000	483 500		
12-12B	Neutral	" " "										
12-13	Albumen (K. C. Only)	" " "										
12-14	Hair and Bristles	" Dried Product										
12-15A	Fresh Beef Cuts	" Received	2-03									
12-15B	Fresh Pork Cuts	" " "	5276									
12-16A	Beef Extract	" " "	572		3400	236	3776	7176	19100	19060		
12-16B	Soda Fountain Supplies	" " "			3810	612	9712	18 632	49580	14500		
12-17	Pepsin	Lbs. Manufactured	49825	131	63 300	229	3664	64 014	183 600	183 000		
12-18	Mince Meat	Tons	165		10 000			0 000	26 615	26 600		
12-19A	Butter	" Unload				55	880	880	234	2336		
12-19B	Eggs	" " "	395		40 000	171	2736	42 000	113 700	113 650		
12-19C	Poultry	" " "	489			37	592	592	1575	1572		
12-19D	Cheese	" " "	293									
12-19E	Storage	" " "										
12-20A	Wool	Tons Wool Produced		2	122 210	2100	600	155 810	414 700	413 912		
12-20B	Pelts	100 Pelts Put Down										
12-16	Grape Juice	" " "			680	47	752	1432	3810	3804		
2-160	Canned Fruits	" " "			680	47	752	1432	3810	3804		
12-160	Miso Cheese	" " "			3400	236	3776	7176	19100	19060		
TOTALS					7356482	616488	7972772	219905				
TOTAL B. H. P. H. PRODUCED												
" " " USED IN POWER H.												
" " " USED BY TENANTS												
B. H. P. H. DISTRIBUTED TO DEPTS.												
CHARGE PER B. H. P. H. DISTRIBUTED												

MOTIVE POWER DEPARTMENT

Distribution of Steam Charges

One Boiler-Horse-Power-Hour Equals 34.5 Lbs. Steam from and at 212° F.

PLANT *Chicago, Ill.*8 Weeks Period Ending *Feb. 16*

1918

Form 9061-XX special 9-0-Nheet 2-7-31-14 16787

DEPT No	DEPARTMENT	STEAM FOR MANUFACTURING				STEAM FOR HEATING		TOTAL B. H. P. H. FOR THE DEPARTMENTS		DISTRIBUTION	Corrected B. H. P. H. Per Unit	CHARGE PER UNIT
		DISTRIBUTION UNIT	NUMBER OF UNITS	RATE: B. H. P. H. PER UNIT	FIRST EXTENSION B. H. P. H.	Sq. Feet Heating Surface	B. H. P. H.	CALCULATED	CORRECTED			
		HRS.	□ ft.									
						73564		21219905	21219905	21186765		
12-20	Pork & Beans		672	347	32	1110		11100	29535	29470		
6-20	Beef Offal		"	2650	32	85000		85000	226200	225750		
	Shipping Cattle		"	4140	32	137300		137300	35110	351331		
6-20	Shipping Sheep		"	2090	32	67000		6700	178240	177920		
12-20	Pork & Meats			871	32	27900		27900	71250	74100		
12-80	V. B. Pork Prod.			915	32	29300		29300	78000	77800		
12-166	Ex. of Extract M.		"	875	32	28000		28000	74500	74350		
	Soda Fountain		"	388	32	12400		12400	33050	32980		
10-11a	Butterine		"	359	32	115000		11500	305984	304020		
		NOT R.										
						</						

(Distribution Made in Kilowatt Hours)

Chicago, Ill

Weeks Period Ending

191 3

DEPT. No.	DEPARTMENT	DISTRIBUTION UNIT	NUMBER OF UNITS	POWER			LIGHT			TOTAL K. W. H. For POWER and LIGHT	DISTRIBUTION POWER and LIGHT	TOTAL K. W. H. PER UNIT	CHARCOAL PER UNIT
				Not Metered K. W. H. Per Unit	First Extension K. W. H.	Corrected K. W. H.	Metered K. W. H.	Total K. W. H. For Power	Not Metered K. W. H. Con. Load in Lights				
5-1	Coffee Booth #1												
6-1A	Packing Hogs	Tons Dressed, Weight	26146		1752	11752	105943	117745					
6-2A	Shipping Cattle	" " "	24414				78061	78061					
6-2B	" Sheep	" " "	2547				1730	4530					
6-2C	" Hogs	" " "	414	14	584	584		584	2.46	424	2255		
6-2D	" Calves	" " "	1024		1475	1475		1475					
6-3	Beef Cutting	" Received	8593				10740	10740					
6-4A	Poultry Killing	" Dressed, Weight											
6-4B	" Packing	" Packed											
5-2	Visitor Entertainment								20	1270			
5-3	Gen Storage						468	468					
7-1	Hog Tanks	Tons Production	4220				3980	3980					
7-2	Beef Tanks	" "	623				10100	10100					
8	Freezer	Tons In	6098		2600	2600		2600	1.9	3710	7075		
10-1	Machine Shop												
10-2	Carpenter Shop												
10-3	Masons and Bricklayers												
10-4	Paint Shop												
10-5	Tin Shop	Tons Tin Plate Cut											
10-8	Laundry and Sewing												
10-9A	Cooper Shop	100 Old Tierces In											
10-9B	Box Factory	1000 B. Lumber Used											
10-9C	Cooperage Manufacturing	100 1/2 Barrels Mfg											
10-11	Store Room												
10-14A	Stables												
10-14B	Wagon Shop												
10-14C	Harness Shop												
10-14D	Horse Shoeing Shop												
10-14E	Automobiles												
10-15A	Ice House												
10-15B	Beef House Icing	Tons Ice Used	2010		3460	2460		3460					
10-15C	Packing House Icing	" " "											
10-15D	Ice Manufacturing Plants	" " Manufactured											
10-16	Stationery												
10-17	Office												
10-18	Packing and Shipping												
10-19	Elevated Railroad												
10-20	Railroad Tracks												
10-21A	St. Cleaning and Crematory												
10-21B	Paper Baling												
10-22	Police												
10-23	Fire												
10-24	Restaurant OLD												
10-26	Milling	Cwt. Milled											
10-27	Laboratory												
10-29	Ice Cases	100 Cases Received											
FERTILIZER													
CAR SHOPS													
PRINTING WORKS													
WHOLESALE MARKET													
RETAIL MARKET													

Distribution of Light and Power Charges

(Distribution Made in Kilowatt Hours)

Plant

Chicago Ill.
8 Weeks Period Ending Feb. 16, 1918

P. H. 2084, A. 25, S. 10, C. 6, 8, 13, 13, 585

DEPT. No.	DEPARTMENT	DISTRIBUTION UNIT	NUMBER OF UNITS	POWER				LIGHT				TOTAL K. W. H. For POWER and LIGHT	DISTRIBUTION POWER and LIGHT	TOTAL K. W. H. PER UNIT	CHARGE PER UNIT
				NOT METERED	First Extension K. W. H.	Corrected K. W. H.	Metered K. W. H.	NOT METERED	First Extension K. W. H.	Corrected K. W. H.	Metered K. W. H.				
		Brought Forward					933 748								
12-20	Pigs for Beans		333	247	1155		155	6	187	157	237 520	57	1612	2670	
12-20	Pigs for Beans		49	10	3760		3960	132	412	1005	7700	1005	4965	8225	
12-1A	Dressed Beef	Tons Transferred In	24414	4	1766		1766				656	7700	17466	28920	
12-1B	" Sheep	" " "	2547	4	1017		1017				656	7700	17466	28920	
12-1C	" Hogs	" " "	414	4	111		111				656	7700	17466	28920	
12-1D	" Calves	" " "	1024	4	111		111				656	7700	17466	28920	
12-2	Canned Meats--Mnfd.	" Manufactured	4364				7463				30 313	10 313	10 313	630 00	
	" --Pur. & Sales						7100				1230	1230	13130	51 60	
12-3A	Smoked Meats	Tons to Smoked	2408	5	1244		12040				4360	4360	6600	27500	
12-3B	Dried Beef	" " "	224	5	2170		2170				822	822	2402	4955	
12-4	S. P. Meats	" Put Down	646	3	4544		19474	8032	25050	61122	6122	80616	133600		
12-4B	Boiled Hams	" Received	282	1	282		282	4	168	404	404	69	1145		
12-4	Barred Pork	" Packed	624	3	1812		1872	4	2780	6785	6785	8657	14350		
12-5	Dry Salt Meats	" Put Down	2553	1	2553		2553	10.5	3270	7485	7485	10538	17230		
12-6	Beef Curing	" Packed	1023	1	1023		1023	5.5	4210	10160	10360	11283	18630		
12-7A	Refined Lard	" " "	2128	3	6		19390				6624	6624	26219	8350	
12-7B	Kettle Rendered Lard	" Packed	267	20			8870				2208	2208	11079	37200	
12-7C	Lard Substitutes	" " "	238	16			58301				6624	6624	22459	37200	
12-7D	Lallow and Grease	" " "	1409	26			9360				4419	4419	13779	22320	
12-7E	Cotton Oil Refining	" Refined	117	1.0			4385				2210	2210	6545	10130	
12-8A	V. P. Pork Products	" Cured	206				1945				2851	2851	4746	7945	
12-8B	Beef Casings	100 Head Killed less End. Sels.	954	20	28776		28776					28776	47700		
12-8C	Sheep Casings	100 " " " " "	1287	1	1287		1287					1287	2134		
12-8D	Gut Strings	" " "	14								2736	2736	2736	4530	
12-8E	Hog Casings	100 Head Killed less End. Sels.	3414	1	3414		3414					3414	5635		
12-8F	V. P. Beef Products	Tons Cured	217				2660				3010	3010	5670	9401	
12-9A	Fresh Sausage	" Manufactured	2217	40	58680		88680	33	30	410	850	10940	19670		
12-9B	Dry Sausage--Mnfd.	" " "	537	1	33480		33480	64	5270	12855		12435	16335	76750	
	" --Pur. & Sales														
12-10	Hides	100 Hides Put Down	1042				2				3589	3589	3541	5950	
12-11A	Butterine--Manufactured	Tons Manufactured	2177				64400	65400			12040	12040	7440	128300	
	" --Pur. & Sales														
12-11B	Soap	" " "					7938	7938			3368	3368	136	18730	
12-11C	Glue	" " "													
12-12A	Oil	" " "	2133				35090	35490			7644	7644	42739	70850	
12-12B	Neutral	" " "													
12-13	Albumen (K. C. Only)	" " "													
12-14	Hair and Bristles	" Dried Product													
12-15A	Fresh Beef Cuts	" Received	2063		2403		2403						2403	3980	
12-15B	Fresh Pork Cuts	" " "	5270		5276		5276						5276	4725	
12-16A	Beef Extract	" " "			1352		1352				2805	2805	4157	6895	
12-16B	Soda Fountain Supplies	" " "			1013		1013						1013	1678	
12-17	Pepsin	Lbs. Manufactured	49425				2110	2110			1133	1133	3243	5375	
12-18	Mince Meat	Tons " "	145		2080		2080						2080	3447	
12-19A	Butter	" " "	1006								402	402	402	1495	
12-19B	Eggs	" " "			393						2808	3218	8218	13605	
12-19C	Poultry	" " "			489							8050	8050	13350	
12-19D	Cheese	" " "	391								1170	1170	1170	1936	
12-19E	Storage	" " "													
12-20A	Wool	Tons Wool Produced	405				42257	42257			3881	3881	46138	77276	
12-20B	Pelts	100 Pelts Put Down													
12-30	Prod. to														

TOTAL K. W. H. PRODUCED
K. W. H. USED IN POWER PL.
K. W. H. USED BY TENANTS

K. W. H. DISTRIBUTED
TO DEPARTMENTS

CHARGE PER K. W. H.
DISTRIBUTED

POWER
322400
82213
12440

LIGHT
46933
2229

277815 1232548 128542 76 64 157847 353689 541536 204607 3392686

Form 3681 (X-2M) Sheet 7 of 10 157585

"Local" Refers to Water Pumped From Wells, Rivers, Etc.

Chicago Ill
8 Weeks Period Ending Feb. 16 1918

DEPT. No.	DEPARTMENT	DISTRIBUTION UNIT	NUMBER OF UNITS	RATE: M. GALLONS PER UNIT		FIRST EXTENSION		Number of Employees	WATER FOR WASHING AND TOILETS M. GALS.		TOTAL M. GALS. FOR THE DEPARTMENTS		CORRECTED		DISTRIBUTION		Corrected M. Gal. Per Unit	CHARGE PER UNIT
				Pur.	Local	Pur.	Local		Pur.	Local	CALCULATED		CORRECTED		Purchased	Local		
											Pur.	Local	Pur.	Local				
	<i>if 1st Mfg</i> <i>Imp. Cherries</i>					7074	787	623	1993			9069	787	2568	821	97300	3284	100554
6-1A	Packing Hogs	Tons Dressed, Weight	26146	3.5	.6	91500	16487	1	353			1507		2088		6017		16172
6-2A	Shipping Cattle	" " "	24144	64	658	15100	16010	395	446			45970	16087	22948	17216	623619	68819	109736
6-2B	" Sheep	" " "	25244	6	124	407	3670	226	723			6115	16010	8480	6718	63640	16872	13201
6-2C	" Hogs	" " "	114		1267	66	607	14	44			110	601	152	634	1177	2336	233
6-2D	" Calves	" " "	102		57	61	523	13	41			102	558	171	582	1092	2328	32
6-3	Beef Cutting	" Received	144					244	17			1117		1741		11975		1475
6-4A	Poultry Killing	" Dressed, Weight																
6-4B	" Packing	" Packed																
10-17	<i>Garage</i>					110						1100		1580		12228		128
						60						60		83		642		642
7-1	Hog Tanks	Tons Production				5275	1275	55	76			5451	5275	7260	5505	48514	22020	86534
7-2	Beef Tanks	" "				934	286	9	29			963	280	1334	292	10325	1168	11493
8	Freezer	Tons In						149	476			476		660		110		5110
								23	73			73		101		73		787
10-1	Machine Shop							626	2010			2010		3770		21970		2154
10-2	Carpenter Shop							75	256			556		770		5400		5960
10-3	Masons and Bricklayers							69	220			220		305		5360		2360
10-4	Paint Shop							28	19			19		123		132		452
10-5	Fin Shop	Tons Tin Plate Cut						66	127			127		204		15		1573
10-8	Laundry and Sewing					3200		12	45			3245		4510		410		34910
10-9A	Cooper Shop	100 Old Tierces In						117	373			373		517		01		1004
10-9B	Box Factory	1000 ft Lumber Used						86	275			275		381		01		2944
10-10	Cooperage Manufacturing	100 1/2 Barrels Mfg						38	119			119		165		12		277
10-11	Store Room							6	9			9		26		20		101
10-11A	Stables					1120		94	200			1120		164		0		15240
10-11B	Wagon Shop							11	35			35		41		2		372
10-11C	Harness Shop							3	10			10		12		0		108
10-11D	Horse Shoeing Shop							1	3			3		4		1		21
10-11E	Automobiles					1120		25	50			50		1662		200		2830
10-15A	Ice House							23	73			73		101		13		152
10-15B	Beef House Icing	Tons Ice Used						19	52			52		58		13		411
10-15C	Packing House Icing	" " "																
10-15D	Ice Manufacturing Plants	" " Manufactured																
10-16	Stationery							11				35		48				272
10-17	Office					4370		24	56			3456		4784		37040		970
10-18	Packing and Shipping							21	131			131		182		1610		11
10-19	Elevated Railroad							42	2			34		186	1585			732
10-20	Railroad Tracks								22			22		30		737		232
10-21A	St. Cleaning and Crematory							5	16			16		24		170		171
10-21B	Paper Baling								6			6		8		62		62
10-22	Police							15	386			386		135		100		4110
10-23	Fire							5	16			16		22		170		170
10-24	Restaurant (NEW)							73	297			297		412		18		318
10-25	Milling	Cwt. Milled																
10-27	Laboratory					280		61	197			275		638		5091		
10-29	Ice Cases	100 Cases Received																
	<i>La. Fresh</i> <i>Factor</i>								74			77		01		125		12
								30	16			46		133		1124		162
FERTILIZER						439		347	1182			1521	14264	21101	14550	1605	54400	7572
CAR SHOPS																		
PRINTING WORKS								140	148			448		621		4805		11
WHOLESALE MARKET								106	435			435		602		2668		118
RETAIL MARKET								42	137			137		111		471		172
		Carried Forward																

MOTIVE POWER DEPARTMENT

Distribution of Water Charges

"Local" Refers to Water Pumped From Wells, Rivers, Etc.

Form 2681 DA 2M Sheet 8, 8-1-13, 157385

DEPT. No.	DEPARTMENT	DISTRIBUTION UNIT	NUMBER OF UNITS	RATE: M. GALLONS PER UNIT		FIRST EXTENSION		Number of Employees	WATER FOR WASHING AND TOILETS M. GALS.		TOTAL M. GALS. FOR THE DEPARTMENTS				DISTRIBUTION		Corrected M. Gal. Per Unit	CHARGE PER UNIT
				Pur.	Local	Pur.	Local		Pur.	Local	CALCULATED		CORRECTED		Purchased	Local		
12-20	Lo & R Beans	Brought Forward	333	22.6		121.98	59378		196.2		14810	59378			5097.6	2477.57		
12-21	P. Meat Butch.		99			21		15	48		80		1114		86.22			86.28
12-1A	Dressed Beef	Tons Transferred In	2547			21		20	64		85		115		9.3			9.13
12-1B	" Sheep	" " "	2547					21	691		691		958		7410			7410
12-1C	" Hogs	" " "	414					36	115		115		159		1230			1230
12-1D	" Calves	" " "	1024															
12-2	Canned Meats—Mnfd.	" Manufactured	4369		6	12128	1768	1370	4430		20358	1768	28207	1345	2182.10	7330		2256.20
	" —Pur. & Sales		333			590	66	30	160		750	66	1039	69	50			3376
12-3A	Smoked Meats	Tons to Smoked	2403	9	2	1926	482	147	377		2303	482	3198	203	247.7	2012		2676.2
12-3B	Dried Beef	" " "	4369	2	3	521	138	24	76		597	130	824	136	610			6744
12-4A	S. P. Meats	" Put Down	6478	19	87	14750	2444	310	926		5960	2404	22050	2510	1726.0	1001.0		1806.70
12-4B	Boiled Hams	" Received	691	12	2	406	51	16	51		537	57	744	4	2160	136		3746
12-4C	Barreled Pork	" Packed	624	25	29	1464	136	36	115		1519	156	2104	163	1631	632		16492
12-5	Dry Salt Meats	" Put Down	2443	2		511		525	1680		2191		3039		33			23413
12-6	Beef Curing	" Packed	1023	212	87	2151	517	48	153		2333	859	3233	896	2538	3134		28614
12-7A	Refined Lard	" "	3154	15		3192		58	185		5517		4687		36270			36270
12-7B	Kettle Rendered Lard	" Packed	247	15		174		25	80		254		352		2725			2725
12-7C	Lard Substitutes	" "	15	15		9700		58	185		3765		5235		40440			40440
12-7D	Tallow and Grease	" "	1409	0		1109		25	80		1489		2368		16020			16020
12-7E	Cotton Oil Refining	" Refined	1717					20	64		64		89		639			639
12-8A	V. P. Pork Products	" Cured	206	10	2	106	1	2	205		41	41	569	43	4404	172		4576
12-8B	Beef Casings	100 Head Killed less Fond. Sets	959	2	0.8	1151	1357	218	660		1811	10357	2520	10809	14318	23236		62746
12-8C	Sheep Casings	100 " " " " "	1287	14	71	244	2246	31	100		344	2200	477	2297	3694	1788		12332
12-8D	Gut Strings	" "	10					88	281		281		356		3011			3011
12-8E	Hog Casings	100 Head Killed less Fond. Sets	344	15	35	144	619	144	461		975	4609	1352	4810	10470	17210		29710
12-8F	V. P. Beef Products	Tons Cured	217	2.0	6.0	434	868	64	205		639	868	885	966	6550	365		6274
12-9A	Fresh Sausage	" Manufactured	2217	1.8	2.0	791	434	51	1452		5442	4431	7548	4628	59430	112		74442
12-9B	Dry Sausage—Mnfd.	" "	837		2.0	515	624	405	1295		2850	1674	3889	1747	10100	6485		37685
	" —Pur. & Sales																	
12-10	Hides	100 Hides Put Down	1043					106	338		338	795	472	762	3654	1018		1018
12-11A	Butterine—Manufactured	Tons Manufactured	2377	1.0				530	1705		3982		5526		42770			42770
	" —Pur. & Sales																	
12-11B	Soap	" "						22	70		70		97		751			751
12-11C	Glue	Tons Manufactured																
12-12A	Oleo	" "	137	1	2	1442	226	19	61		1555	426	2159	445	16720			18500
12-12B	Neutral	" "				073												
12-13	Albumen (K. C. Only)	" "																
12-14	Hair and Bristles	" Dried Product	2															
12-15A	Fresh Beef Cuts	" Received	2403					3	10		10		14		08			108
12-15B	Fresh Pork Cuts	" "	5276					85	272		272		377		2917			2917
12-16A	Beef Extract	" "						67	217		67		100		7475			7475
12-16B	Soda Fountain Supplies	" "						10	326		191		1		1740			1740
12-17	Pepsin	Lbs. Manufactured	49823					1	54		3644		5055		38571			38571
12-18	Mince Meat	Tons	165					3	107		107		148		1143			1143
12-19A	Butter	" "	1066					13	333		233		323		2500			2500
12-19B	Eggs	" "	345					52	166		166		230		1750			1750
12-19C	Poultry	" "	486					5	6		6		8		62			62
12-19D	Cheese	" "	346					0	32		32		44		324			324
12-19E	Storage	" "																
12-20A	Wool	Tons Wool Produced	505					174	560		560	22000	780	26624	1108	167		12508
12-20B	Pelts	100 Pelts Put Down																
12-15C	Fresh S. P. Lard		572															
TOTALS						185	6130		37947		22342	41167	31967	12423	237	2345	484669	

TOTAL M. GALLONS

PURCHASED

LOCAL

M. GALS. USED IN POWER PL.

M. GALS. TO BE DISTRIBUTED

CHARGE PER M. GALLONS

484669

2500.17

MOTIVE POWER DEPARTMENT

Distribution of Air Charges

Plant

DISTRIBUTION IN 1000 CU. FT. FREE AIR

Weeks Period Ending

191

Dept. No.	DEPARTMENT	DISTRIBUTION UNIT	NUMBER OF UNITS	RATE PER UNIT	FIRST EXTENSION	^{0/0} CORRECTED Balance	METERED	TOTAL	DISTRIBUTION	CORRECTED M. CU. FT. PER UNIT	CHARGE PER UNIT
6-1A	Packing Hogs	Tons Dressed Weight	26 46	.6	15 688			15 688	41920		
6-2A	Shipping Cattle	" " "	20 114			2.8	5355	5355	4370		
6-2B	" Sheep	" " "	25 17			1.4	2678	2678	2160		
6-2C	" Hogs	" " "	4 16			.7	839	1334	3580		
6-2D	" Calves	" " "	1024			.7	1339	1331			
6-3	Beef Cutting	Tons Received	8595								
6-4A	Poultry Killing	" Dressed Weight									
6-4B	" Packing	" Packed									
7-1	Hogs Tanks	Tons Production	4220			2.8	5355	5355	325		
7-2	Beef "	" "	623			2.8	5355	5355			
8	Freezer	Tons In	6098								
10-1	Machine Shop										
10-2	Carpenter Shop										
10-3	Masons and Bricklayers										
10-4	Paint Shop										
10-5	Tin Shop	Tons Tin Plate Cut				22 6	43233	3233	115490		
10-8	Laundry and Sewing										
10-9A	Cooper Shop	100 Old Tierces In									
10-9B	Box Factory	1000 Ft. Lumber Used									
10-9C	Cooperage Manufacturing	100 1/2-Barrels Mfg.				5.6	1070	0708	28620		
10-11	Store Room										
10-14A	Stables										
10-14B	Wagon Shop										
10-14C	Harness Shop										
10-14D	Horse Shoeing Shop										
10-14E	Automobiles										
10-15A	Ice House										
10-15B	Beef House Icing	Tons Ice Used									
10-15C	Packing House Icing	" " "									
10-15D	Ice Manufacturing Plants	" " Manufactured									
10-16	Stationary										
10-17	Office										
10-18	Packing and Shipping										
10-19	Elevated Railroad										
10-20	Railroad Tracks										
10-21A	St.Cleaning and Crematory										
10-21B	Paper Bailing										
10-22	Police										
10-23	Fire										
10-24	Restaurant										
10-25	Milling	Cwt. Milled									
10-27	Laboratory										
10-29	Ice Cases	100 Cases Received									
	Fertilizer					12 8	24475	24475	65377		
	Car Shops										
	Printing Works					.8	18745	18745	50000		
	Wholesale Market										
	Retail Market										

CARRIED FORWARD

MOTIVE POWER DEPARTMENT

Distribution of Air Charges

Plant

Chicago, Ill.

8 Weeks Period Ending Feb. 8, 1918

DISTRIBUTION IN 1000 CU. FT. FREE AIR

Dept. No.	DEPARTMENT	DISTRIBUTION UNIT	NUMBER OF UNITS	RATE PER UNIT	FIRST EXTENSION	CORRECTED <i>200 Balance</i>	METERED	TOTAL	DISTRIBUTION	CORRECTED M. CU. FT. PER UNIT	CHARGE PER UNIT
BROUGHT FORWARD											
12-1A	Dressed Beef	Tons Transferred In	24412								
12-1B	" Sheep	" " "	2547								
12-1C	" Hogs	" " "	414								
12-1D	" Calves	" " "	1024								
12-2	Canned Meats, Mnfd.	" Manufactured	4369				28.2	53935	53935	44.50	
12-2A	Can'd Mts. & Baked Beans		333	.074	10			10		27	
12-2B	Can'd Fish, Vegetables, etc.										
12-3A	Smoked Meats	Tons to Smoked	2488		12040			12040		32180	
12-3B	Dried Beef	" " "	434								
12-4A	S. P. Meats	" Put Down	6448	5.6	36389			36389		97240	
12-4B	Boiled Hams	" Received	282	5.2	1466			1466		3916	
12-4C	Barreled Pork	" Packed	624								
12-5	Dry Salt Meats	" Put Down	2552	2.1	6360			6360		11325	
12-6	Beef Curing	" Packed	1023								
12-7A	Refined Lard	" "	2128	.7	2			253		6820	
12-7B	Kettle Rendered Lard	" "	347								
12-7C	Lard Substitutes	" "	2334	0.3	12635			12635		23760	
12-7D	Tallow and Grease	" "	1409								
12-7E	Cotton Oil Refining	" Refined	1717								
12-8A	V. P. Pork Products	" Cured	206	1.0	206			206		551	
12-8B	Beef Casings	100 Head Killed (Less Cond., Sets)	959	5.0	4795			1795		12815	
12-8C	Sheep Casings	100 " " " "	1287			1.4	2678	2678		7160	
12-8D	Gut Strings		14								
12-8E	Hog Casings	100 Head Killed (Less Cond., Sets)	3414	.4	365			1365		3647	
12-8F	V. P. Beef Products	Tons Cured	217								
12-9A	Fresh Sausage	" Manufactured	2217	4.8	10640			10640		28430	
12-9B	Dry Sausage, Mnfd.	" "	837	4.8	4030			4030		10770	
12-10	Hides	100 Hides Put Down	1043								
12-11A	Butterine Manufactured	Tons Manufactured	2277								
	" Pur. and Sales										
12-11B	Soap										
12-11C	Glue	Tons Manufactured									
12-12A	Oleo	" "	2137			8.4	16065	16065		42422	
12-12B	Neutral	" "									
12-13	Albumen (K. C. Only)	" "									
12-14	Hair and Bristles	" Dried Product									
12-15A	Fresh Beef Cuts	" Received	2403								
12-15B	Fresh Pork Cuts	" "	5276								
12-15C	Fresh Beef Products		572								
12-16B	Soda Fountain Supplies										
12-16C	Grape Juice										
12-16D	Canned and Dried Fruits										
12-16E	Imported Cherries										
12-17	Pepsin	Lbs. Manufactured	4182								
12-18	Mince Meat	Tons "	61								
12-19A	Butter		1006								
12-19B	Eggs		395								
12-19C	Poultry		485								
12-19D	Cheese		396								
12-19E	Storage										
12-20A	Wool	Tons Wool Produced	505								
12-20B	Pelts	100 Pelts Put Down									
12-20	Peanut Butter	Tons	99								
TOTALS					77			27439		74470	

Total M Cu. Ft.
M Cu. Ft. Used in Power H.
M Cu. Ft. to be Distributed

Charge Per M Cu. Ft.

